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NEWS IN BRIEF

**OECD study
by Logica**

THE economic and social implications of international transmission of computerised information in Europe are to be studied by Logica under a contract from the Organisation for Economic Co-operation and Development.

The OECD is staging a seminar on the subject in Vienna from September 20-23. The Logica study will provide information on the use that is already being made of international data networks in Europe.

Amdahl profits

AMDAHL Corp reports that in 21 months of active marketing of its 470V/6 mainframe, aggregate pre-tax profit has matched the total start-up investments made in the first five years following the foundation of the company in 1970.

Privacy views

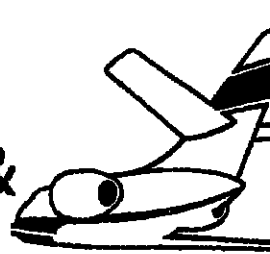
THE combined views of the BCS, the CSA and the DPMA on privacy will be issued soon in a statement being prepared at a meeting of those organisations this week. While differing on the details of privacy legislation, the three hope that an industry view on privacy matters will help the Data Protection Committee in drawing up proposals for legislation.

Warwick's one 168

THE IBM online bureau service based on a new centre in Warwick, (CW, November 25, 1976), is now expected to go live next spring with one 370/168, although the centre has the capability to hold six 168s. The network will have 80 high speed lines and will be monitored and controlled by a Medius network management system from International Aeradio.

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**ONE
THAT
GOT
AWAY**



Being a data processing manager needn't always be hell-on-earth, as Bob Morley of Trident Television found while touring company properties to gather information for a computerised fixed asset system. At Windsor Safari Park, which Trident owns, he met a not-so-fixed asset, a dolphin called Flipper. Trident is running Safe Computing's Safe fixed asset system on its ICL 1801T to keep tabs on over 100,000 fixed assets.

**US holds up parts
for Soviet contract**

THE \$43 million air traffic control system being built for the Soviet Union by Stansaab of Sweden is being held up by the need for components worth about £100,000.

The US Department of Commerce has so far not granted an export licence for the components, memory chips and other integrated circuits, which are the standard devices used in the Stansaab Censor computers.

If the licence is not granted, Stansaab can get similar components from Japanese manufacturers, but this would entail some redesigning which would be costly in both time and money.

The USSR is anxious to get the system into service by 1980 because of the vast increase in air traffic which will be generated by the Moscow Olympics.

Stansaab is 50 per cent owned by the Swedish government, and there is anger over the Commerce Department's delay, because in 1974 Univac, one of the rivals for the Soviet contract, was granted a provisional export licence for the whole of its ARTS 3 traffic control system.

According to Gunnar Wedell, managing director of Stansaab, Univac came close to a broad co-operative agreement with Stansaab for the whole world, apart from the US and Japan.

"However, when the Soviet Union contract went out to tender, Univac was not prepared to make a joint bid with us and the plan to co-operate with them collapsed," he told Computer Weekly. "When we won the contract, Univac came back and asked if they could come in with us, but of course we were no longer interested."

Univac acknowledges that it offered help with the contract 18 months ago, and said it offered assistance again this year. Stansaab denies that it has had any approaches from Univac since the end of 1975.

The contract is to build terminal control centres in Moscow, Kiev and Mineralnyye Vody, and an area control centre in Moscow (CW, September 25, 1976).

Dashboard computer


PERSONAL computing creeps a little bit closer this week with the news that Chrysler, in the US, is about to decide on a supplier for a dashboard mounted "trip computer" that is expected to be offered as an option on cars produced in 1979 or 1980.

Mosiek, Intel and National have submitted single-chip microcomputers for evaluation with the car manufacturer, where the chosen device will probably be used to provide driver information such as speed, elapsed time, fuel consumption, etc.

Initial estimates indicate that an order for 100,000 devices will soon be forthcoming.

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**ICL aims to
double
its turnover**

A DOUBLING of turnover to £724 million by 1982 with 60% of business coming from overseas, is a main aim of ICL's plan for the next five years. And this performance would be achieved with only a 14% increase in staff to 35,700, giving ICL a turnover per employee of £20,300 and putting it in line with US competitors.

The plan shows that of the hardware orders in 1982, almost two-thirds by value will be for products which have not yet been announced. It indicates that those products could include a laser beam printer running at 20,000 lines per minute, holographic memory, disc systems with capacities of 20 times those of today's systems, and processors handling arithmetic at 50 times the current top rate.

"Even to maintain our present level of orders we must sell users the ability to process about 10 times as much work as at present," says the company.

ICL expects there to be a continued demand for medium-sized systems, and next year it plans to introduce the S1 and S2 and step up production of the 2860.

These medium-sized machines will help spread management control among individual sites. "This will create a need for computers with good management information systems at the centre and, in outlying locations, smaller computer systems or terminals and effective, fast communications."

The plan adds that "ICL must be prepared to provide suitable computers" to software houses which build systems around minicomputers.

On the software side, ICL says VME/B and VME/K will be the only two major operating systems for the next 10 years. "As most basic work on these systems has been largely completed, the next five years will chiefly involve making them portable and developing software for special purpose languages, the management of distributed processing and of databases, and programs for microprocessors, small systems and software driven components."

The success of the plan, says ICL, will depend partly on a reduction in the rate of inflation and increases in staff productivity. But it adds, "Success could make a dramatic impact on this country's balance of trade in computers, bringing the UK a surplus of £1,000 million by the end of the 1980s."

**Challenger
from NCR
now in UK**

THE new entry-level NCR 3200 series system, announced earlier this year in the US (CW, May 28), has now arrived in the UK.

Designated the I-8230, it is an interactive system competing with Burroughs' B80, IBM's System 34 and the ICL 220, but with "more advanced interactive multiprocessing capabilities," said NCR.

The basic system consists of a 48K-byte processor, expandable to 80K-bytes, five Megabytes on disc, tape cassette, VDU and 55 lpm matrix printer, and costs £21,450 for the hardware. Standard software packages for manufacturing, distribution and financial applications are available.

Maximum configuration offers 20 Megabytes on disc, three VDUs and line printers running at up to 200 lpm. Up to six tasks can be run concurrently.

The disc drives, with capacities of 4.8 or 9.6 Megabytes on fixed discs are new, as is the 200 lpm band printer. There are also new matrix printers with average speeds of 70 and 120 lpm.

NCR has also slashed the price for add-on memory for the I-8250; an extra 16K-bytes now costs £1,230 instead of £2,250 and an upgrade path via the I-8250 to the I-8430 is also provided.

NCR is now prefacing the model numbers of its 8000 series machines with an I, an N or a V. "I" means that the system is primarily for interactive working, "N" implies that it works in "normal" or batch mode, and "V" means that it is a virtual system.

IBM 3033 lottery results

DELIVERIES of the first of IBM's powerful 3033 processors have been scheduled and customers who ordered within the first two weeks of the announcement of the machines last March have been given the first six months in 1979 as the delivery period.

The delivery schedule is the result of a lottery which IBM held on orders placed in the first few days. IBM described it as "randomising the orders and sequencing them in a fair and equitable manner" (CW, June 23). This followed the weeding out of orders placed by organisations and individuals who hoped to sell their places in the queue (CW, June 2).

The UK leasing company Leasco, which ordered four 3033s, has been offered one for January and another for June, 1979. Another leasing firm, United Leasing, which says it ordered within an hour of the announcement of the 3033s, will get machines in March and June, 1979.

United Leasing chairman Parry Mitchell, says that "if someone puts in an order for with IBM now they won't get delivery for three or four years."

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Printed in Great Britain by Q.B. Limited, Sheppan Place, Colchester, CO3 3LJ, and published by IPC Electrical-Electronic Press Ltd, Dorset House, Stamford Street, London, SE1 9LU

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Briefing

**Insac's man
in US**



**Two new
views**

THE man to lead the US operations of the NEB's Insac has been chosen. Insac does not intend to announce the name until its UK organisation has been finalised, but Cyrus Joffe, formerly with Univac in the US, is understood to be favourite for the post.

The US is Insac's first export target and the aim is to have an office in New York with a president in place "by early autumn," according to Joan Pearce, chief architect of the Insac venture (CW, July 14).

Employees share

THE scheme to sell shares in the company to ICL employees (CW, July 14), was approved at an extraordinary meeting of ICL shareholders on August 11. About 13,000 employees will be sent a letter at the end of the month giving details of the scheme. It involves a save-as-you-earn plan over a five-year period, at the end of which employees could own up to 2,502,657 shares - 17% of ICL's issued share capital.

Series 1 contract

THE first contract for Altergo's IBM Series 1 consultancy service has been signed with a big IBM user. No name has been disclosed but Altergo is known to have projects in hand for both manufacturing and service companies, requiring sizeable networks of Series 1s (CW, June 2).

New HP line soon

A NEW range of computer systems is expected to be launched by Hewlett-Packard within the next few months.

DEC mainframes

THE future of the DECsystem line of 36-bit mainframes lies with the newer DECsystem-20 rather than the DECsystem-10, said a DEC spokesman. US sources suggest that the current 2050 processor will be complemented by a 2080 with cache memory.

Tote choice


FOLLOWING the cancellation of its contract with General Automation earlier this year (CW, March 31), and its decision still to go ahead with its £3 million plan for computer controlled betting systems (CW, July 28), the Tote has opted for Digital Equipment PDP-11/34 minicomputers.

NCR Datapac link

CLOSELY following the announcement of its Distributed Network Architecture, oriented towards packet-switching technology, NCR is to supply an interface processor complete with Standard Network Access Protocol software which will enable Canadian businesses to use the Datapac packet-switched network for linking to remote computers.

School system

ONE of the UK's leading schools, Manchester Grammar School, is installing a Systime series 3000 computer, as a teaching aid for the 1,450 pupils



Tom Gill

Microdata bids for CMC Europe

AFTER less than two years under full European ownership the three companies that make up CMC Europe now look like returning to US ownership. Microdata, minicomputer manufacturer of Irvine, California, is bidding \$11 million for the group.

Microdata's president, Don Fuller, told Computer Weekly that he hopes the deal will be completed within two months.

The French, German and UK based firms that make up CMC Europe form what is described as a loose association. The Dutch registered holding company, Telsis, owns 75% of their combined stock, including 100% of CMC UK, while Industrial Leasing AB, of Sweden, holds 25%.

The president of CMC Europe and founder of CMC UK, Ray Parry, is a major shareholder in Telsis.

The main CMC business is the manufacturing and marketing of key-to-disc systems, but the UK company has also been selling the Microdata Reality file inquiry system for two years.

In France Reality is built under licence and marketed by Inter-technique, and Fuller says this agreement will not be changed.

The deal will not affect the agreement between Sycor and the CMC companies under which the latter sell the Sycor 400 terminal cluster in Europe. (CW, February 17). Earlier this year Sycor was interested in acquiring a majority share in CMC but negotiations were not concluded, (CW, May 18).

COMPUTER WEEKLY'S INSIDE NEWS

Toronto tales

Last week over 3,600 people from 50 countries gathered in Toronto for IFIP 77, an international congress in which nearly 100 sessions were held in five days.

Malcolm Peltu and Stephen Bell were there to provide an on-the-spot report on the flesh and blood behind the facts. And Chad was there to provide a few down-time notes.

Accounting for DP

Computers mean far more to accountants than merely acting as supercharged book-keeping machines.

Prize guy

For his lucid explication of some of the problems of protecting privacy on computer databases, "Jolly Welford" won third prize in the Computer Weekly/Infotronics data security competition. His prize-winning essay is published this week.

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APPOINTMENTS

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**P to Q3
disc mate**

THE chess challenge game between British International master David Levy and the Russian program Kaissa was abandoned on Sunday due to a disc interface fault.

The match was due to take place in Toronto after the Second World Chess Championship and was sponsored by an international consortium with Computer Weekly, Amdahl Corp, I. P. Sharp, and Control Data, all providing resources to try to get the game underway.

Levy has a £1,250 bet with a number of academics that he will not be beaten by a computer chess program before August, 1978, and has already beaten the new computer chess champion, Chess 4.6.

Kaissa, running on an IBM 370/168 had lost its world computer chess title (see Page 2) and it was thought that, against a human master, the more powerful Amdahl 470 V/6 might be needed. Amdahl therefore made available a V/6 at its Sunnyvale, California, site.

Last Friday, with Levy at Sharp's Toronto office, the first attempt was abandoned because of a fault in the transmission of the program.

On Sunday at 10 am, Levy, having won the toss, ploned through the first move from a hotel in Columbus, Ohio.

The move, P to Q3, was input by another international master, L. Day via a terminal at Sharp's Toronto HQ which had again

Turn to page 19

AGM ban in aid of Russian scientist

AS a protest against the imprisonment of Russian computer scientist Anatoly Shecharansky, the executive of the American Association of Computer Machinery has decided to stop co-operation with or co-sponsorship of any events where Russian computer scientists play a significant role.

Shecharansky has not been heard from since his arrest five months ago on charges of being a CIA agent.

Some senior members of the ACM council, however, are to challenge this decision at the next council meeting on October on the grounds that more can be done for Shecharansky in particular, and Soviet scientists in general, by maintaining contact with the Soviet scientific world.

The Shecharansky issue simmered beneath the surface throughout IFIP, erupting on the penultimate day when ACM president Herb Grosch announced the non-co-operation decision at a meeting called to protest against Shecharansky's imprisonment.

Mrs Shecharansky is now living in Toronto, and as her husband has been particularly involved in computer chess, IFIP became a focus of the international campaign to release him. A number of computer chess experts in Toronto for the world computer chess tournament, signed a letter of protest about Shecharansky's treatment.

The campaigners for Shecharansky claim that he is being persecuted as part of a general Soviet anti-Semite campaign.

The Russians claim, however, that his contacts with other leading dissidents, such as academician Sakharov, and Western politicians like Senator "Scoop" Jackson, show that Shecharansky was involved in what they call anti-Soviet activities.

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COMPUTER WEEKLY

Vol. 23 No. 563
Thursday, August 18, 1977
Editor: Malcolm Peltu
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IPC Electrical Electronics Press Ltd.,
Dorset House, Stamford Street, London, SE1 9LU.
Telephone: 01-261 8000
Telex: 28137 BISPRS G
Overseas Cables: Comweek Blanespress LDN SE1
Branch Offices:
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Telephone: 021-356 4838
Manchester: 205 East 42nd Street, New York NY 10017
Telephone: (212) 887-2080
Published weekly on Thursday Registered at the Post Office as a newspaper. Price per copy, 18p.
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Subscription requests should be sent to: IPC Business Press (Sales & Distribution) Ltd, Oakfield House, Portsmouth Road, Haywards Heath, Sussex RH16 3QH. Tel: 0444 55188.

UK Circulation: 75,000 with the highest fully requested circulation in the UK. International Edition (10 issues a year) Circulation 95,219 (UK 75,000, Int 19,138)

IFIPVIEW

Decision on Russia a blow to concept of IFIP

THE ACM decision effectively to cease co-operation with Russian computer science activities (front page) was a major blow to the fundamental concept of IFIP — International co-operation.

And many who sympathised with the emotional intent of the action felt that the politicising of IFIP could lead to its ultimate destruction.

Dick Tanaka, whose presidency of IFIP ended with the ending of the congress, said at the opening ceremony, "There are those — even some who are close to IFIP — who fail to understand the sincere and continuing effort within IFIP to nurture and defend the concept of international co-operation as free of political influences as possible. And there are those who would turn IFIP into the same kind of political forum that so many other international organisations have become."

Although this remark did not explicitly relate to the protests that had been taking place in

Europe, it was a clear statement of the position of those who support the concept of international co-operation. What makes the event unique is the gathering together of people from many countries, firstly to organise the complex programme and then to meet together to talk, listen, discuss.

While there is a lot to be said for holding to one's moral and political principles, there are so few genuine international forums today that IFIP, despite its faults, is something to cherish and nurture.

By the time of the next congress in Japan and Australia in 1980, IFIP should examine some of the areas of neglect highlighted last week (see front page) and should become more relevant to some of the issues facing the world as a whole, not just the computer community.

And efforts should be taken to strengthen its international base, particularly to Third World countries. In Toronto, the vast majority of speakers and delegates were from what could be called the developed nations of the Western world and East Europe.

QUOTE

"We should not assume politics and economics are the same. They are not. Politics defy understanding, economics defy analysis." — Dr Dick Tanaka, retiring IFIP president.

Toronto over the detention of Russian computer scientist Anatoly Shchiransky this issue must have been close to his thoughts.

In the end, IFIP tried to take a neutral role in the affair, going to the length of cutting off its name from headlines on leaflets distributed about Shchiransky but not banning the leaflets and notices about a protest meeting held in one of the rooms used by the conference.

The fear of those who oppose the decision of the ACM — taken by the executive committee in Toronto — is that, by its emphasis on international co-operation, IFIP gives an opportunity for computer scientists to meet and discuss technical and social issues in as free and open way as is practical today.

International co-operation is perhaps the only valid reason for having a massive congress like IFIP 77. The NCC in Dallas last June and the numerous other conferences throughout the

world cover the same areas in a less elephantine way.

What makes the event unique is the gathering together of people from many countries, firstly to organise the complex programme and then to meet together to talk, listen, discuss.

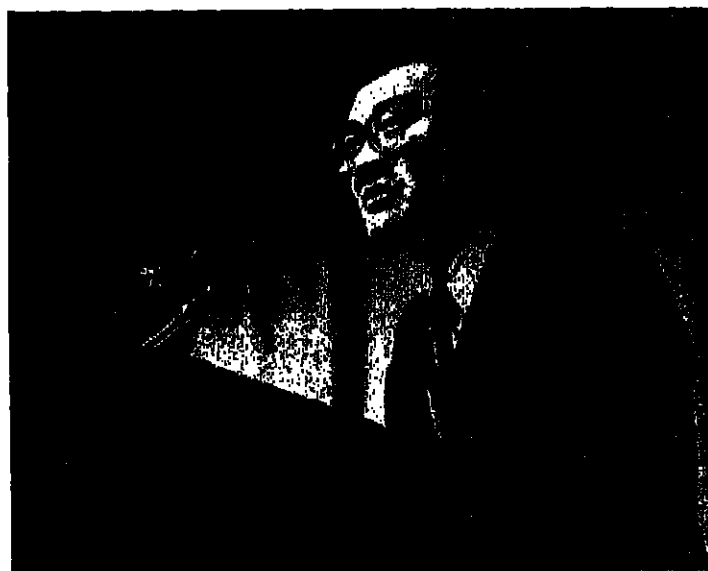
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— Malcolm Peltu

A more human interface



Dr Dick Tanaka... "We can all do more than we have."

Kaissa loses world chess title

FOLLOWING its surprise defeat in the first round of the Second World Computer Chess Championship in Toronto, the Russian program Kaissa lost its world title to the American Chess 4.6.

But early fears that a bug had been introduced to Kaissa during its transfer from an ICL System 4 to an IBM 370 version have now been dismissed.

Sixteen programs competed in the tournament, with the top British entry being the six-player master from the Atomic Energy Research Establishment.

The tournament is played in a Swiss-style league, which starts off with a seeded first round and pairings for subsequent rounds dependent on previous performance. Four games were played by each team.

In this set-up, Kaissa and Chess 4.6 never played each other in the tournament proper but a special exhibition game between the teams was arranged, with Chess 4.6, from Northwest University, emerging as winner, and, therefore, undisputed world chess champion.

Chess 4.6 ran on Control Data Cyber 176 processing 15 million instructions per second, and the Russian program Kaissa enjoyed good Western hardware in the shape of a 5 mips IBM 370/168.

Consternation was created by the strange case of the bug which was not a bug. Kaissa's defeat by Chess 4.6 from Duke

University (CW, August 11) was signalled by an apparently suicidal free gift of a rook in the middle of its first round game.

It was unanimously concluded by the chess experts present that this moment of madness was the result of a previously undetected program bug.

Next day the Moscow programmers Mikhail Donskoy and Vladimir Arlazarov reported the results of a program trace. The bug was no bug, but an act of calculated desperation.

The assembled chess masters, including Grandmaster Botvinnik who had flown from Moscow to watch the play, had failed to see that the burnt offering of a rook was Kaissa's only way to dodge a deep laid and devious mate in five.

In the exhibition game between Kaissa and Chess 4.6, fireworks abounded. Wild and turbulent mid-game positions and unexpected shifts in the balance of fortunes eventually simplified down to a four-pawns-against-three ending, theoretically, a straightforward win for Chess 4.6.

Programmers David Slate and Larry Atkin alighted with relief as their program, now searching out to depths of 10 and 12 ply in the look-ahead tree, gave a wholly deceptive appearance of knowing what it was doing, and played out to victory like a master.

— Donald Michie

Impact of hobbyists

COMPUTER hobbyists are probably having a more profound effect on technological developments than the radio amateurs did in the early days of radio, according to Paul Baran of Caldata Associates.

In his IFIP paper on the past, present and future of networks, Baran suggested that the hobbyists would provide most of the motivation and creative energy in building people-to-people communications networks that will make information technology a "pro-people" one.

These networks would be used for electronic message switching, networks, games, social and work contact.

Baran concluded that, "By restructuring the existing tariff structure for record traffic by passing government controls, we may be able to do more to make effective and international co-operation at the per-

son-to-person level than all the grandiose institutions that have been tried in the past, including the United Nations, international broadcasting, the Soyuz-Apollo link-up and large scale diplomatic agencies taking turns entertaining one another at the expense of the taxpayer of the hosting nations."

— Stephen Bell

'Micro has meant 25-year leap back'

THE microprocessor has meant a "great leap backwards of 25 years" in programming technology according to Professor Edsger Dijkstra, a structural programming pioneer.

In a remarkable speech that electrified the audience attending a session on the impact of microcomputers on computing, Professor Dijkstra made an all-round assault on the micro, suggesting not only that it has set back programming standards but that problems with testing chips could lead to chaos.

He said that the micros were an example of how money had become "the currency of thought."

"We used to say that com-

puters were expensive because they were so great; now it is said that micros are so great because they are so cheap."

He said that he was "sickened and appalled" by some of the programming examples he had seen in the American hobbyist home-brew computer magazines because they contained all the programming bad practices that software engineering techniques had tried to eliminate.

Many delegates violently disagreed with his attack.

The UK's Iann Barron, who chaired the session, pointed out that verification techniques in micro-electronics had proved satisfactory to date, and that the micro, rather than leading to

Cutting violations of database by half

AN important concern of the non-DP user faced with a database is the problems of security and privacy. These were treated at some length by speakers at IFIP.

Norman Nielsen, of the Stanford Research Institute, California, addressed the entire topic of "system integrity," embracing security, audit and recovery problems. His approach was a statistical one, analysing prior detected violations of system integrity and deducing the frequency of particular types of violation, and hence the most effective safeguards.

It was concluded that over half the cases of violation could have been prevented by appropriate operational and procedural measures.

These areas were often neglected by present-day advisers on security. On the other hand, external security, which is given a good deal of attention, would

have proved effective in a very small percentage of cases.

On a cost-effectiveness front, operational safeguards were also among the easiest and least expensive to implement.

A number of comments came from Nielsen's audience. One of the most telling critics disputed the validity of acting entirely on the evidence of detected violations. The proportion of undetected violations might be entirely different, he said.

Another interesting paper in the security area was given by Dorothy Denning, of Purdue University. Many databases now implemented allowed access to a statistical sample of data; but, in theory, not to data related to particular people.

The paper investigated the feasibility of making several queries on different subsets of the database, so that their overlaps would permit isolation of the facts on a single person.

Wilkes looks to future of systems 'off the peg'

STATIONERY shops selling low cost micro-based systems was one of the visions of the future sketched by Professor Maurice Wilkes of Cambridge University, in his look beyond today's computers.

Professor Wilkes, who was one of the pioneers of computers and programming methodology, also stressed that the role of the Post Office would be crucial to the future of computing because "the fusing of computers and telecommunications" would open up important choices for users in deciding between local and remote facilities.

While the very small business would be able to purchase micro business systems in high street stores, Professor Wilkes could not see the end to the central

computer facility.

The building blocks for the new main system would be microcomputers incorporating compact, low cost and high capacity non-volatile memory, such as bubble memory.

These microcomputers would combine to perform similar functions to today's mainframes. But one crucial area of change, said Professor Wilkes, would be the elimination of the huge disparity of speed between high speed main memory and fixed hard disc and drum storage which are currently used for operating system swapping functions.

Bubble memory could replace drum-type storage, which would also help to simplify operating systems.



Report from Toronto by Malcolm Peltu and Stephen Bell

Different role for information

ONE of the best received papers came from Bob Tricker of the Oxford Centre for Management Studies, who looked at the impact of information systems on organisational thinking.

Tricker's main thesis is that the "information explosion" is not merely a matter of quantity. With efficient information systems, information takes on a qualitatively different role.

"Labour wants information about the company's achievements and intentions," said Tricker. "This is not required merely as a tool for wage bargaining; it results from a fundamental realisation that information is a valuable resource crucial to power. Power can be defined as the ability to make things happen."

The information-power relationship lay at the root of many of the crises felt increasingly by modern management, and the noticeable shift in manage-

ment roles, he said. The managers themselves, however, had not realised this phenomenon until comparatively recently.

Tricker then posed the question "Does the organisation structure depend on the information system, or vice versa?" He concluded that the relationship worked both ways; information and organisation were interdependent.

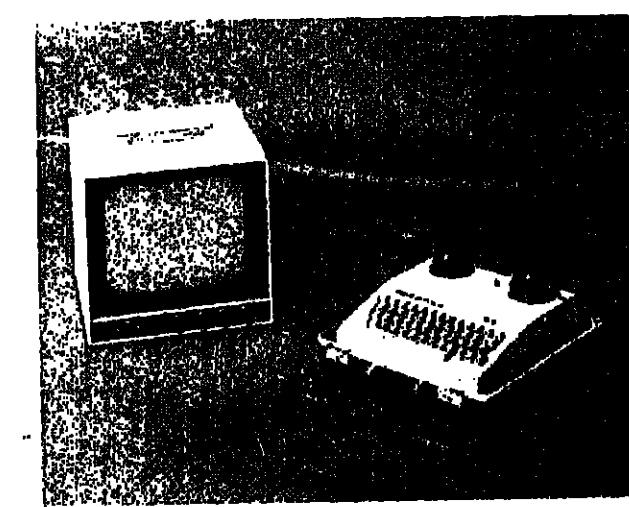
Availability of information affected the organisational structure and employees' roles. Equally, information needs were dependent on the role of the person requiring the information, and on the prevailing situation. Both were a factor of the organisational structure.

Tricker demonstrated this interrelationship by outlining the information system structure of five companies, and inviting his audience to deduce the form of the companies' organisation.

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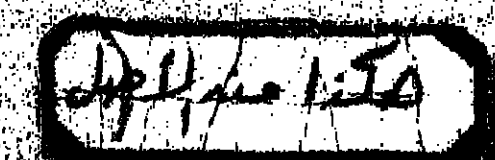
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DOWNTIME

by Chad

Terror of the Toronto bus

THE Canadian air traffic controllers' strike may have cut the attendance at IFIP down from the originally projected 4,000 or 5,000 to about 3,000. But those who did attend can now bore their friends with their own particular tale of the Toronto busing terror.

Computer Weekly's team, for example, spent eight hours getting to Detroit, during which British Airways showed the Silver Streak and one reel of "Fun and Games With Dick and Jane" as the steward called the Jane Fonda-George Segal film.

A 4½-hour ride was then promised to get to Toronto. It turned out to be a seven-hour trip, including an hour-and-a-half stop at the border to have passports stamped, plus a three-times-around Toronto airport force while the authorities decided whether or not luggage should be checked by Customs.

Our American correspondent, Hesh Wiener, had a shorter bus ride from Niagara Falls. But one of the three buses taking his plane-load of

passengers broke down, so they packed all passengers into two buses.

And at the airport, the bus was told to "act like a plane". So it drove down the runways, directed by airport ground staff. And the passengers even had to play the game of waiting at the normal luggage carousels, instead of getting their suitcases straight off the coach.

The final word on air traffic controllers, however, came in the final words of the closing ceremonies of the conference, made by the new IFIP president, Professor Paul Bolliller.

Reminding everyone that IFIP in 1980 will be held for the first half in Japan and the second half, four days later, in Australia, he said: "And let's hope there is no airline strike. Bussing arrangements between Japan and Australia might be difficult to arrange."

"Perhaps the only way of overcoming the high relative cost of software is to go back to child labour in the interests of miniaturisation." — Professor Maurice Wilkes of Cambridge University.



The optimism of the band of the Royal Regiment of Canada which performed at the opening ceremonies ranged from Everything is Coming Up Roses to I'm Looking Over a Four-leaf Clover.

Paul Godfrey, chairman of the council of the municipality of Metropolitan Toronto, could have done with a touch of the clovers. In welcoming the delegates he said, "I am sure you will

appreciate the wonderful facilities in the town as..." at which cue the microphone broke down.

Once the sound was on again, he added with a smile, "I was going to say, as typified by this hall..."

Passing over the 13th

THE well-known APL specialist bureau, I. P. Sharp, lives on the 14th floor of the York Centre in Toronto. As in many North American buildings, the 14th floor is the one above the 13th.

This particular example of the superstition is obviously the fault of the building's designers rather than Sharp, but a spokesman admitted that "The company does suffer badly from triskaidekaphobia".

It seems that some Sharp people also suffer badly from dictionary-swallowing but, after all, APL and Greek do have a lot in common.

One of the manifestations of Sharp's fear of 13 is the numbering of its APL update notices to users, which also avoid the dread figure. This enabled one enterprising em-

ployee to insert a "spook" notice, with the reference number 13, informing users of a function called "Quad-CL". This would advise a user that the output obtained from a program, while not that expected, was reasonably close.

One of the characteristics of any convention like IFIP is the way so-called experts can fundamentally disagree on crucial issues. Compare, for example, the following statements:

"I am sickened and appalled by the standard of programming to be found in hobbyist magazines." — Professor Edgar Dijkstra, structured programming specialist.

"Hobbyist software tends to be better written than commercial programs." — Packet-switching expert Paul Baran.

In the world of the expert, perhaps the one-eyed naïve user could be king!

'Use of computers in libraries should be stamped out'

IN the view of one US librarian, promises made about the use of computers in libraries were fraudulent, large sums of money were spent for small return, and such machines should be stamped out.

This was one of many lively quotations given by Professor Gerard Salton, of Cornell University, when he spoke at a joint meeting of the BCS Information Retrieval Group and Cambridge University Computing Department.

In his talk Professor Salton described the state of the art in libraries in America. He dealt with the attempts to introduce computers and outlined the present position. The library could utilise computers in four possible ways: by piecemeal mechanisation, by implementing integrated library systems, by co-operative schemes between groups of libraries using network facilities, or by developing the library of the future.

The first of these was tried between 1955 and 1969 and was not very successful. The reasons for failure lay in the complex nature of library operations. They contained very large files. At Cornell, for example, there were 4 x 10⁶ items, each of which generated an average of 15 cards. It was a dynamic environment with a large number of additions, and these were rapidly increasing.

The diversity of operations was much higher than a data processing system with simple file processing and library staff ideally wanted a system operating in real time so that the location of any book could

Philip W. Williams, chairman of the British Computer Society Information Retrieval Group, reports on a joint meeting with Cambridge University Computing Department, at which Professor Gerard Salton, of Cornell University, introduced some provocative views on the use of computers.

be determined instantaneously.

Professor Salton also gave a rapid glimpse of a future in which the problems of storing and transporting knowledge in heavy books could be eliminated. Texts could be created in electronic form; searching and retrieval could be by terminal access to text, graphs and tables through the telephone network; requested items could be made available either as microfiche or computer generated from stored text.

In discussing present and recent research effort, Professor Salton suggested that we were now in a position to make substantial improvements in information retrieval, although no commercial manufacturer had yet mounted a system using these modern ideas. A desirable system would include these components: an automatic indexing system with an open-ended vocabulary which could adapt to a changing environment; an automatic method for producing a tentative content analysis; a method of clustering documents by means of some similarity measure so that like objects could be stored together and represented by a

sample member to reduce the number of documents scanned in a first comparison; interactive searching with relevant feedback, so that the experience of searching could be used to modify the indexing and classification; a dynamic environment in which the feedback was allowed gradually to promote or retire documents so the re-classification determined by cumulative searching experience could take place.

The research by Professor Salton at Cornell and by Dr K. Sparck-Jones and others at Cambridge, has placed us in a position where these methods are available for implementation to create the next generation of retrieval systems. However, in a reply to a question, Professor Salton was rather gloomy on the prospects of these ideas being easily accepted in library schools, since he felt that the curriculum was totally wrong.

He believed that few professors in library schools knew enough to teach these new methods and even fewer students would understand them owing to their lack of mathematical vocabulary and understanding.

It is intended to follow this successful meeting with a forum presenting alternative store technologies for very large databases. This meeting will take place at City University on Wednesday, September 28, at 2 p.m. Details can be obtained from F.W. Williams, Computation Dept. UMIST P.O. Box 88, Sackville Street, Manchester.

LETTERS

Public service notion

LET me say how alarmed and disappointed I am by the largely self-interested approach of the articles concerning posts and telecommunications that have appeared in Computer Weekly.

To judge by these reports the advent of computers is the most important event to hit the Post Office. But to whom is it so important?

Obviously to Iann Barron, Chris Evans, ICL and IBM — it is their livelihood. But let us not confuse the interests of the computer industry and its gurus with the interests of the average person in the UK.

While the telecommunications side of the Post Office has been making ever-increasing profits by placing massive investment into high technology, the postal service has been rapidly deteriorating. It may well be that "computers are going to affect our lives," but not necessarily for our own good.

The telephone is by comparison an ancient invention yet still we have not reached the era of a "phone in every home". I do not think we need to fear a "terminal in every home era" in the lifetime of this planet.

The most important problem as I see it is one that receives little space in your columns. How much power has the man in the street to safeguard the meagre postal service that remains to him (and which he understands) against the advance of big business and computer technology which press for ever more investment in high speed telecommunications?

To split the postal service from telecommunications, I fear, will be the death knell of the post as we know it and as many depend solely upon it.

It is time we got back to the notion that the Post Office is a public service and not the Mercury of the largest and most powerful users.

DAVE HARAN
Department of Social Research,
University Hospital of South
Manchester

How to get positive response from 'ops'

WHY all this fuss about operators' responsiveness to the computing environment? Is it BCS-orientated where some "egg-head" is about to startle the industry regarding the importance of successful computer operations? It may even be that this concept has finally sunk in after 15 years.

After 12 years in this field, and having progressed through to almost every type of operation, I can say with profound conviction that it will take a very long time to change the present situation.

This is primarily due to the basic fact that there exists a dividing line between systems/programming and operations.

The chief culprit in this situation is the data processing manager. He may well have to bolster confidence and ego in his "prized" departments, but in this process adopts the "they are your minions" principle. Can this approach be correct?

Several years ago I laboured the point in these columns about the "team work concept" in computer departments only to obtain several snide, sarcastic egg-headed comments.

The rude awakening has now dawned that with the more sophisticated systems, these egg-heads have regrettably discovered that the operations department has become even more important now.

Surely, the user is the one who is going to derive the greatest satisfaction from obtaining his output on time, accurately computed. This calls for a high degree of enthusiasm in the relevant departments.

The stark reality is that these departments have been sadly neglected, badly motivated and totally ill-prepared for their role in customer liaison.

This simply does not just happen. If operations personnel are suitably trained and motivated, they will respond positively to the needs of the environment.

Broken interview promises are one of the contributory

factors. Poor documentation for data prep and program fault diagnosis is another weak area. Proper training facilities are important. Shift working conditions are very important. Maybe some of these egg-heads who have never worked after 5pm probably don't know what the term "shift working conditions" means.

At one large US-owned company, the computing area was deemed to be massive. Nearly 30 staff worked on each shift, this comprised 15 shifts in the week and invariably six at weekends. There was one coffee machine (not free) which was generally out of action after 5 pm. The company was beset with low staff morale and absenteeism. Yes, it was indeed very difficult to understand why they were beset by such problems. One would have thought that the Americans had never heard about psychology and motivation.

Basic commonsense would be all that is needed to achieve a more positive response from operations staff, plus the will to want to do something positive.

Inevitably one will only get what one is prepared to put into a department — this is the crux of my contention.

Thus, because of this apathetic attitude, the accounting and personnel departments should want to start "asking questions." Such matters as high staff turnover, expensive re-runs — both machine time and stationery — and user inconvenience should prove to be very interesting talking points.

Statistically, all operations departments cannot be as glum (or can they?), as there must be some managements endowed with some commonsense.

This is the only recipe for a successful department and where throughput could be at its maximum efficiency.

Surely it is about time the BCS realised that there just could be a professional status to computer operations and recognise this within its (full) membership status. Maybe it is waiting for a White Paper on the matter?

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TELEX

Reorganising UK telecommunications industry: a poser for the working party

THE thorny problem of how to reorganise the UK telecommunications industry is being discussed by one of the government's 40 sector working parties. These are tripartite

talking shops set up under the auspices of the National Economic Development Office and include representatives of government departments, unions, and industry.

The working parties were established to seek ways of regenerating British industry.

The core of the telecommunications problem is employment. Obsolete electromechanical telephone switching equipment is still being built for the Post Office simply because its manufacture is labour intensive,

whereas the more modern electronic reed relay exchanges, and the upcoming System X have a comparatively low labour content.

There is, therefore, a need to reduce the capacity within the telephone exchange manufacturing industry, which principally involves three companies, GEC, Plessey and the ITT subsidiary STC.

Plessey has been hit hard by cutbacks in orders from the Post Office. GEC, on the other hand, has net cash assets of some £470 million, and has said in the past that it would welcome the formation of a single British telecommunications manufacturing company, by merging the interests of the three existing sup-

pliers. It argued that such a company was necessary to enable the British industry to compete effectively with giants like GTE of the US in world markets.

A rash of speculation has surrounded Plessey in recent months, and several possible suitors have been named, among them Racal and STC itself. Any solution involving Racal would probably include a break-up of Plessey, because Racal is interested only in investing in success, and there would be little industrial sense in Racal taking over from Plessey as the third telephone equipment manufacturer.

GEC has not figured in recent speculation, and is not keen on getting involved in any more painful industry reconstructions at present.

The government would be unhappy to see Plessey fall into the hands of the American ITT, but some solution might be found where ITT sold a proportion of the STC equity to UK investors, as it has done in Germany with its SEL subsidiary.

The most promising proposal being discussed at present is the formation of a new company, jointly owned by the Post Office, GEC, Plessey and STC, which would develop, manufacture and market the System X all-electronic telephone exchanges.

If a major reconstruction of the electronics industry is to take place, Decca as well as Plessey and Racal are likely to be involved. But despite all the speculation surrounding prominent companies like these, GEC has indicated that it has its eye on overseas investment.

And Racal, as well as looking overseas, is currently investing in several small companies, among them Flight Refuelling, and the Brooks Group, which

makes marine navigation aids, security systems and car radios.

The most significant outcome from any of the sector working parties so far has been a decision to make grants to the ferrous foundry industry to alleviate a potential shortage of castings when the long-awaited industrial boom gets under way.

Industry sources indicate that the main value of the sector working parties will be the personal contacts which have been made with individuals in government departments.

Plessey has reported results for the year to March 31, 1977, in which turnover grew 16 per cent to £569 million, of which 51 per cent was done overseas.

Exports from the UK were up 38 per cent at £94 million, and net profit after extraordinary items was up 21 per cent at £12,437,000. The main extraordinary item was a loss of £7,720,000 for the costs associated with closing telecommunications plants following the cut-back in Post Office ordering.

Pre-tax profit was up 14 per cent to £39.58 million.

— Tim Palmer

MDS holds takeover talks

MDS in the US is holding preliminary takeover discussions with Keuffel and Esser, a precision engineering manufacturer with an annual turnover of about \$90 million.

Keuffel and Esser is based at Morristown, New Jersey, near to the MDS headquarters at Parsippany. It builds reprographic, drawing office and surveying equipment. In the first half of this year, it made a \$37,000 net profit on sales of \$45 million.

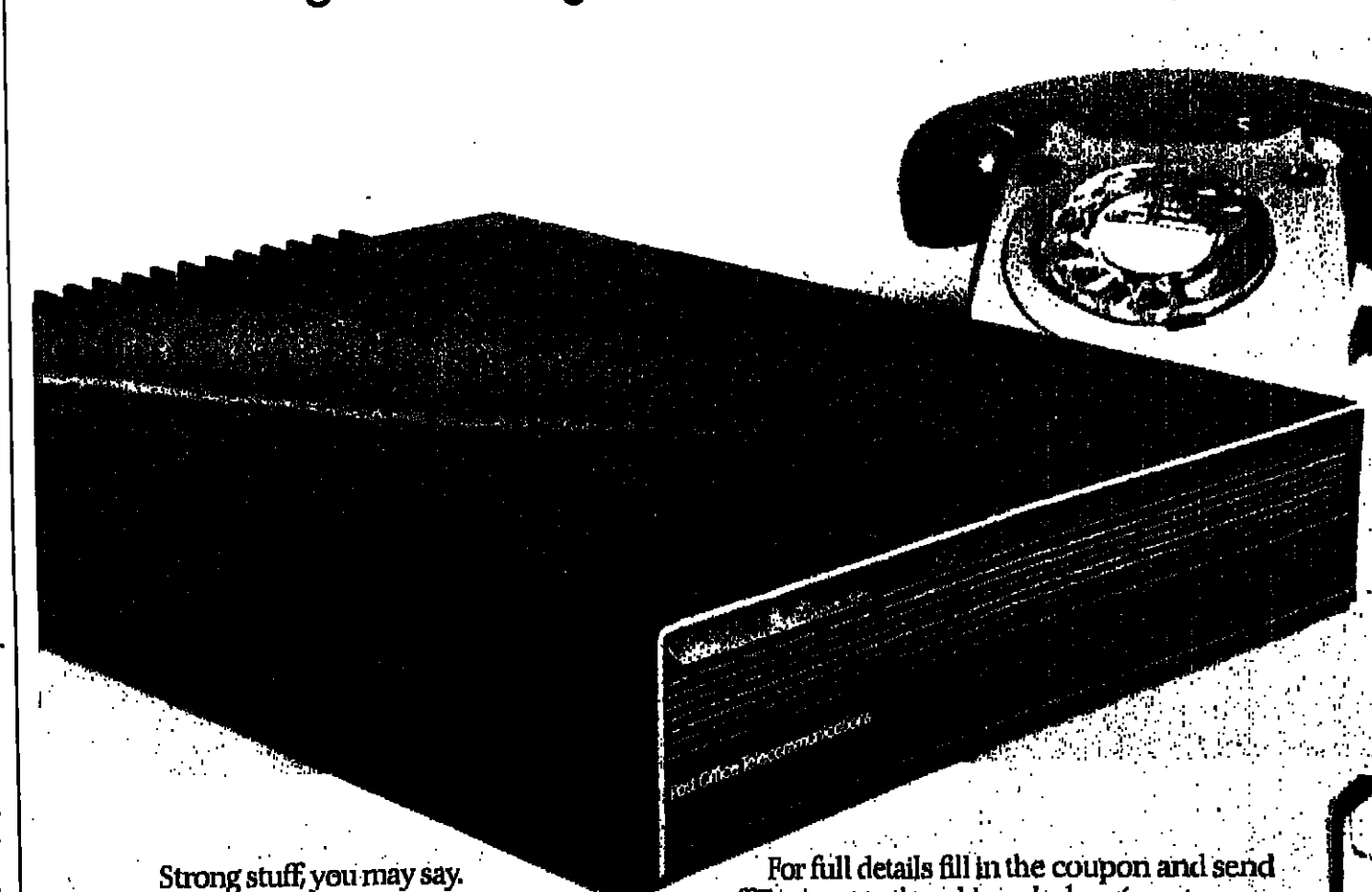
MDS turnover in its 1977 financial year ended April 30 was \$146 million — 10% down on 1976. MDS attributes this to the planned withdrawal of some unprofitable product lines (CV, May 19). Its net profit in fiscal 1977 was also down, from \$13.6 million in 1976 to \$4.6 million.

But MDS points out that the 1976 figure included extraordinary items of \$11.5 million compared with only \$1.9 million in 1977.

MDS bank debt at the end of fiscal 1977, at \$33 million, was \$25 million lower than in the year before.

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Last week's IFIP congress re-emphasised the gathering revolution in information technology that is likely to create considerable shake-up in intellectual, social and economic life throughout the world.

Starting this week, Professor Donald Michie, head of the Machine Intelligence Department at Edinburgh University, will be providing a fortnightly Private View on research advances that will influence the course of this revolution.

Donald Michie was one of the Blatchley Park team which worked on Colossus, the codebreaking machine that is now regarded as the world's first electronic computer (CW, July 28).

In 1960 at Edinburgh University Michie began studies of machine learning and heuristic search. In 1965 he set up the experimental programming unit which developed the POP-2 language, and he played a leading role in developing Edinburgh's computer-controlled robot FREDDY. He became the world's first professor of machine intelligence in 1976.

THE Western world usually assumes that it is light years ahead of Eastern Europe in all aspects of computer development.

While this may be true in the hardware field in particular, at a recent conference on machine intelligence at Ropino, near Leningrad, a number of Soviet contributions were of a quality which left many Westerners, to misquote James Bond, stirred if not shaken.

The conference, which I co-chaired with Academician G. S. Pospelov, was the Ninth International Machine Intelligence Workshop, and it amply proved that it is no longer only in the Western world that we see laboratories "striving to develop computers with as much intelligence as human beings" to use the colourful phrase used by The Times to describe research into machine intelligence.

Let us first take robotics, a field in which the US President, Jimmy Carter, has recently raised the stakes with a \$600 million hand-out. Pasadena's Jet Propulsion Laboratory, their Mars Rover intelligent exploratory vehicle is to be operational by the mid-1980s. Why intelligent? Might it not be enough for it to be just plain clever, or even dumb but dogged?

Well, you would then have to radio-control it from Earth, telling it at each step what to do next. But since radio signals take half an hour or so to travel the distance, this is not practicable.

Radio signals, yes, but only to convey strategic commands. "Go behind the large triangular rock and collect a soil sample."

Tactical ways and means are for the on-board computing system to work out. Hence the need for it to be reasonably "intelligent".

Any other motoring problems on Mars? The terrain certainly looks stony, with crevasses and boulders here and there. JPL have put their trust in wheels, and I wish them the best of luck. But at Ropino we were reminded that legs are not such a bad idea after all.

The latest film from Moscow

Donald Michie

Disc-space control package for Honeywell Level 66

LATEST package in the disc-space control market has been developed by Trident Computer Services, of Camberley, Surrey and Birmingham. While most such packages approach the IBM machines, Trident's Filcon is aimed at Honeywell Level 66

A minimum size is initially specified for sequential files under Honeywell's Gcos operating system. Increase in the amount of data above this limit, pushes the limit up; but with subsequent decrease, the limit does not move back again.

Filcon reduces the size of the file to that of the actual data content, freeing the empty space. This also handles the case where the initial minimum size specified was too large.

Fortran on OLS bureau enhanced

AN enhanced version of Digital Equipment's Fortran is now available in the UK on the DECsystem-10s run by OLS Computer Services. The OLS enhancements include advanced string and array handling and new printout formats for business applications.

OLS said that its array handling facility will enable the user to specify an array size at run time, thus saving memory by using no more than is needed.

A character string can be written in to a variable. And the report formatting facilities make it easy to print to book keeping conventions such as brackets around negative amounts of money.

OLS has also developed interfaces between Fortran-10 and its applications products including its information management system Oliver.

An OLS spokesman said that although Fortran-10 was introduced several months ago it was company policy to wait until all bugs were cleared before implementing a new language.

1974 ANSI Cobol for Univac 1100s

A COBOL compiler which is claimed to conform to all the ANSI 1974 standards has been developed by Univac for its 1100 series of mainframes. The compiler is being tested at customer sites in the UK and is expected to be released officially in October.

Univac said the most significant of the 189 changes to the compiler included improved and clarified random and sequential file handling methods; a multi-key indexed input and output facility, with normal index sequential file handling as a subset; expanded variable-length table handling; and extra merge, library copy and debugging facilities.

In addition to the ANSI standard Cobol enhancements, Univac has added an EBCDIC tape file handling system, multi-tasking facilities, extensions to the DMS 1100 language to make database access easier in accordance with Codasyl specifications and fully re-entrant compiling facilities which produce re-entrant object code which can share common library routines with PL/I and Fortran programs.

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Computer bums, hackers, non-documenting whizz-kids, self-taught geni of the small hours, and all who write incredibly clever and incredibly unstructured programs, please take note!

Donald Michie

First projects

THE specification and implementation of a stock recording and control system, a BOMP-type database, and a fixed assets system using Taskmaster are among the first projects handled by a consultancy set up at Selsdon, Surrey, by Bill Kidston, Louise Hussey and Brian Addington. Trading as Dewcourt, they aim to provide consultancy services for a wide range of systems including 370s.

There are now six committees. They are

the Cobol committee; the data description language committee, responsible for the Schema language; the end user facilities committee, formed last year to look at interfaces with databases for staff with no computing ex-

perience (CW, February 5, 1976); the Fortran data manipulation language committee; the systems committee, responsible for research in advanced languages and techniques; and the recently formed common op-

SOFTWARE FILE

NAG library boost for Prime 300s

THREE major software products — the Numerical Algorithms Group library of numerical subroutines and compilers for Algol 60 and Coral 88 — have been announced by Prime Computer.

And the NAG library in particular is expected to be a strong selling point for the Prime 300 minicomputer.

There are about 300 NAG subroutines for use in teaching, pure sciences and research and development. The system, which is "exceedingly well documented" according to Prime, includes an example run of each routine, complete with input test data and results.

Prime is only the second company to arrange a licence with the NAG group at Oxford University, the other being ICL. The NAG group sells the library itself to users of other machines, although it is discussing more licence agreements with other manufacturers.

The library was originally developed by five UK universities, but last year the group became a non-profit making company supported largely by the Department of Education and Science's Computer Board (CW, May 20, 1976).

Prime is marketing the library worldwide and offering full support, including training and system updates. The package costs a single payment of £5,500 or an annual charge of £1,200. Substantial discounts are offered to educational institutions.

The Algol 60 compiler is licensed from Wootton Jeffries and Partners, which developed the system on the Prime computer. It runs as a time sharing bureau machine. Prime said the product will be of special interest to users of old Elliott and ICL machines looking for upgrades.

At present a pre-release version with limited input and

First phase of tanker fleet reports system

A COMPUTER system developed by Computer Management Group is being used by the Irano-British Ship Service Company, oil tanker operators, to prepare monthly financial reports on fleet operations.

The system is based on a Burroughs 880 mini and presents reports in a variety of currencies.

Irano-British says that this is only the first phase of computerisation, as the entire operation is due to move to Iran in 1978.

The Irano-British Ship Service Company is a joint venture between the BP Tanker Company and the National Iranian Tanker Company, formed last year to operate a fleet of 10 tankers.

Grope runs on: 370 systems

rating system: control language committee, set up to develop a job control language which is independent of suppliers (CW, April 7).

The new address is: Codasyl, PO Box 1808, Washington DC 20043.

output is available. Full input and output facilities will be available very soon and future extensions will include double length variables, direct compilation to binary with optional generation of assembler code and a re-entrant compiler generating re-entrant code.

The compiler is available for a single payment of £3,500.

The Prime 300 is now on the Ministry of Defence's list of

approved machines for Coral. The language is already used at four Prime sites, including Computer Aided Design in Cambridge. Coral costs £4,000 and is fully supported by the company.

Prime's software offering could be further enhanced shortly by an APL system. The company said that APL, which is being considered initially for Scandinavian market.

45% more efficient Necol
A 45% increase in speed is one of several improvements which have been made to Necol, the system for converting NCR Next/3 programs to ANSI Cobol. The system was introduced by Computer Facilities Software of Cleckheaton, West Yorkshire, just two months ago (CW, June 5).

Most of the improvements reduce to a minimum the manual editing needed after conversion. The system now automatically removes the quotation marks enclosing numeric literals, and the company said that the editing

of printer records and control blocks is now no more than a minor task.

The speed increase reduces the processing time for converting 1,000 lines to less than 10 minutes.

In the UK conversion is done on the NCR 8220 run by Computer Facilities Software's sister bureau company in Southampton. The system is sold on a disc pack overseas. The company added that it has had a large number of inquiries from the UK, Canada, Australia and several European countries.

SOFTWARE developed by the Post Office's National DP Service to help control supplies for the RAF has been rewritten in a way which enables it to accommodate another processor, and this increases real time performance by about 60%.

The original software was a modified version of the Monitor system which formed part of the London Airport Cargo EDP Scheme, Lances.

As used by the RAF, the software runs on two ICL System 4/72s, one processing real time transactions from 500 video display terminals at RAF stations around the UK and in West Germany. The other handles batch work.

A request for goods can be entered at any VDU. The system first searches the local RAF

station's records for the item required and, if it is not found, looks at the records for other stations. It is claimed to locate any item within five seconds.

With increasing requests, the present system is becoming overloaded, so the RAF decided to install a third 4/72 alongside the others at the Supply Centre in Hendon, and to request appropriate modification of the software. The new machine will share the real time in a dual processor configuration.

The new software, known as Dual Monitor, will retain the same mode of operation, data base management functions and user interface as the present Monitor. It is expected to be up and running within the next few months.

Laura Coaker, from Bristol, an operator turned programmer, says the advantages of a trainee programmer with operating experience are that he can visualise the computer and the operations department; he is familiar with the operating system; he knows to a certain extent how best to use the computer; and he knows the common programming errors which cause operating problems.

But most important of all, she says, he has friends in the computer room. This is important because normally the relationship between operators and programmers is "tenuous to the extent of being hostile." And this is because of each side's ignorance of the nature of the other's job.

Operators rarely get the chance to program, and programmers are uninterested in operating. When this situation is coupled with the physical isolation of the two groups of workers it is hardly surprising that the working environment is not always as pleasant as it might be.

One problem which prevents operators moving into programming is the different

qualifications for the two jobs, says Coaker. Programmers need at least an A-level but operators can get jobs with a few O-levels.

"The A-level requirements could therefore be waived for the operator who is keen to enter programming," she says. "Obviously not all operators want to become programmers and the nature of the programming project might necessitate high academic qualifications, but perhaps if the demand for paper qualifications were relaxed where possible, more operators might feel encouraged to take an active interest in programming."

Coaker gives a word of warning, however, to operators considering a move to programming. Although she had sufficient qualifications for the move it was not an easy step to take.

How many other programmers have come from operating? What problems have you found? And when it comes to the "promotion stakes, do graduates or people with better academic qualifications get preference?" Programmer Notes would like to hear

EDITED BY STEPHEN BELL

Panvalet's prestige customer

A PRESTIGE customer, in the form of BOC's bureau subsidiary Datasolve, has been won by Panvalet for its program library management system Panvalet.

The package, which now has 3,800 users around the world, was chosen as a detailed evaluation of several other systems including Datasolve's own Program Maintenance System.

Panvalet has been implemented on Datasolve's IBM 370 mainframes at Oxford Circus in central London, because, said the company, most of its future development work will be done there.

Leyland APL order

AN expansion of the use of APL by Leyland Cars in Coventry has been confirmed by the award of a contract to I. P. Sharp Associates to supply APL time-sharing services. Leyland Cars said it could have an in-house service within two or three years.

The main use of the language will be in planning. Leyland Cars currently is using APL for looking at the effects of different budget strategies for manpower planning, including the staffing of the programming department; for planning the number of cars likely to be needed in each market around the world; and for modelling work-in-progress in its engine plant.

The chief impetus behind this trend is the increasing cost of the labour-intensive task of software maintenance. With improved communication of initial program requirements and improved capabilities for testing or proving the correctness of programs, software maintenance effort and expenditure could diminish drastically.

The lines for a panel discussion on programming management on the first day of the congress were laid down by Michael Jackson. Although not present himself, he had given all speakers some ideas on which to base their remarks.

The state of the art in software development is not satisfactory, said Jackson. "There are already

IFIP orientated towards the implications of DP for humanity

THE orientation of the IFIP congress towards the implications of computing for humanity at large did not ignore the important sector of humanity: the programmers and software developers.

They have their own problems in interacting both with the machine and with the non-DP-orientated personnel who request development of programs.

A number of IFIP sessions brought out significant ideas for software development techniques which, though at present primarily an object for academic study and use on large software products, are expected to spread rapidly into DP installations in general.

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many fronts of attack in trying to improve the situation, but we are not even sure of the nature of the problem. Are some of our 'cures' only concealment of the symptoms?" he asked. "Is radical surgery necessary?"

Consultant Tom Gilb, who will be starting a regular column in Computer Weekly next week, was particularly dismissive of some current techniques.

"We worship techniques like structured programming, without having quantified its effect," he said. "A religion is all right for a stable environment, but software development is not such an environment."

Along with development of quantification methods for such desirable attributes as maintainability, flexibility and portability, one should keep clearly

in mind which of the goals were most important in which portions of the system, said Gilb.

Much discussion was devoted to the specification of requirements. Barry Boehm, of TRW, recommended use of a requirements specification language, in which a rigid document could be developed and signed by the user.

W. Hetzel, of the Blue Cross medical insurance company, felt that such rigidity could be used by the developer as an excuse for a refusal to adapt.

Discussion of change raised a question treated in Programmer Notes (CW, July 21): is it better to alter a program or completely rewrite it? It was accepted that discarding of old programs could be more widely practised. "If programs are not thrown away,"

said Ian Sharp, of I.P. Sharp Associates, "the organisation becomes the slave of the system."

Sharp had his own set of "golden rules" for good development, other principles being short programs and full documentation. "There should be enough documentation to recreate the program without looking at the code."

A subsequent panel session on the attendant topic of software reliability, opened with an attack from the legendary Edgar Dijkstra on the entire concept and the engineering view of software which it implied. "Software is not like a hammer," he said, "it is more like a mathematical theorem; knowledge is required to use it."

If a program did not stand up

under misuse, he added, the cause might be that its conditions of use had been inadequately defined. It would be meaningless to say that the program was not reliable.

This sparked off a discussion on the scientific and engineering ways of assessing a program's reliability: by mathematical proof and by exhaustive testing.

The solution, suggested Susan Gerhart, of IBM, would be to use both methods, one supplying the deficiencies in the other.

Together with the more specific technical sessions, these discussions gave a useful demonstration of the tools available to the software developer.

A continuing problem, it was agreed, is the difficulty in persuading the ordinary developer to use such techniques.

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154



WHAT, you're using US equipment? Education Secretary Shirley Williams shares a joke with three Honeywell Keyplex data entry system operators during a visit to the Department of Education and Science's personal records centre at Darlington, Cleveland. The operators are Ellen Vart, Irene McGann and Gillian Moss.

Andrew Brown has joined Jensen Computer Systems as a systems analyst having previously been a customer software representative in Olivetti's systems department. Chris Mathews, a former PDP11/40 operator from Zimmer Orthopaedic, has joined Jensen as a trainee programmer.

Norman Campbell has been appointed DP manager with James Buchanan the whisky distillers, at Stepps, near Glasgow. Previously he was a project leader in the computer department of Strathclyde Regional Council.

Tom Bowler, formerly systems programming manager with Union Carbide, has joined Systems Resources as a senior designer. Graham Foxwell comes to the company as senior analyst, which was also his position with Associated Engineering Group in Coventry, his previous employer.

David Dury and David Prior have been recruited by Charringtons Computer Services as marketing executives. Dury, a former Burroughs sales executive, will cover Essex and Suffolk while Prior, who has been selling accounting systems for Olivetti, will take on the Hertfordshire, Cambridgeshire and Bedfordshire areas.

Jim Hewitt, lately of ICL, where he was a systems executive, has joined Rediffon Computers as a systems analyst based in Leighton Buzzard.

Michael Morse, senior programmer at System Aid, has been promoted to team leader, development division.

Marconi Fellowship candidates invited

PROPOSALS are invited for candidates for the 1978 Marconi International Fellowship, which commissions "significant creative works" in communications, science and technology.

The £25,000 fellowship, which was established in 1974 to commemorate Guglielmo Marconi's contributions to scientific discovery, is granted each year to an individual in recognition of outstanding contributions towards this goal. The recipient is invited to give a public lecture based on the commission. He may designate another person to undertake the work in connection with the fellowship if he wishes to do so.

Nominations must be received by October 15, 1977. Further information may be obtained from The Marconi International Fellowship Council, Aspen Institution for Humanistic Studies, 1811 Fourteenth Street, No. 811, Boulder, Colorado 80302, USA.

Phil Noden has become technical director of the manufacturing division of YB Computer Services. He joins the company from Control Data, having been manager of test and assembly at CDC's Brynmawr factory. Roger Billing, formerly YB's North-West regional manager, becomes OEM marketing manager while retaining responsibility for special accounts in the North-West.



Betty Howe, Honeywell's corporate guest services and travel manager, receives her award for 30 years' service from (left) Honeywell Information Systems president Clancy Spangle, formerly the UK company's managing director, with (right) Honeywell UK managing director Russ Handerson.

COURSES

ELECTRICAL engineers who wish to extend their knowledge in the communications field can take a part-time MSc course in communication systems offered by the Polytechnic of Central London. An area is approaching in which many classic communication systems functions will be radically remodelled, and one of the main objectives of the course will be to provide training in underlying theory felt to be of long-term relevance to development of complete systems. Classes occupy one full day a week for two academic years. Graduate level competence in electrical engineering is a necessary qualification for applicants. Further details from the Registry of Engineering and Sciences, The Polytechnic of Central London, 115 New Cavendish Street, London W1M 8US, tel: 01-496 8811, ext 6335.

THOSE involved in assessing and implementing distributed processing systems may be helped by a course from Infotech,

to be held in London on September 8-9, and entitled How to Choose a Distributed Processing System. Further details are available from Chris Boon, Infotech International, tel: 0633 92585.

THE programme of courses from SIA for September to December includes linear elastic frame analysis using the Leap 4 suite, next running in Edinburgh on September 21, offshore engineering computer services from SIA, October 4 in London, corporate modelling and financial planning with ICMS, September 30 and November 10 in London, and SIA computer-aided design service for high-way projects in developing countries, November 3 in London. For the full programme and further details about the courses mentioned here, contact The Sales Manager, SIA Ltd, Ebony Gate, 22 Lower Belgrave Street, London SW1W 0NW, tel: 01-730 4554.

NCC SEMINARS

The National Computing Centre

'THE PROTECTION OF DATA BY CRYPTOGRAPHY'

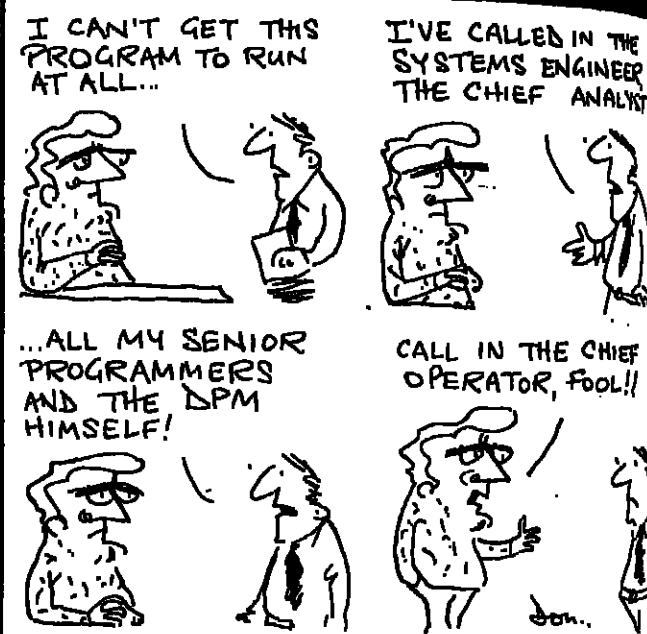
Cumberland Hotel, London W1
Wednesday, September 28, 1977

This one-day seminar, run in association with the National Physical Laboratory, aims to introduce cryptographic methods, to consider capabilities for data protection and to examine implications of applying these methods. In particular the US Federal Data Encryption Standard (DES) algorithm will be introduced.

As new legislation approaches, this important and topical subject will be of wide interest to data processing and security personnel. For further details contact:

Seminar Bookings
THE NATIONAL COMPUTING CENTRE LIMITED
Oxford Road, Manchester M1 7ED, Tel. 061-228 8333

Liveware File by Don



Calls for papers

PAPERS are invited for the third Jerusalem conference on Information Technology, subtitled Computers, Communications and Technology Transfer. It has been organised by the Information Processing Association of Israel with the support of the Israel Ministry of Science and Technology. The conference will be held at the Sheraton Hotel, Jerusalem, from October 15-17, 1977.

The conference will place particular emphasis on technology transfer between countries, industries or social environments, and papers highlighting such transfer are specially required. The deadline for four copies of MSS is December 15, 1977.

Further information about the conference may be obtained from JCIT 3 Secretariat, IPA, P.O. Box 13009, Jerusalem, Israel.

A CALL for papers dealing with any aspect of DP audit, control and security has been issued by the Institute of Internal Auditors, Inc. and the Automation Training Centre, Inc. Joint sponsors of the eighth Conference on Computer Audit, Control and Security. "How-to" papers, case histories, and accounts of personal experiences with advanced systems will be of particular interest, although papers on any aspect of the above-mentioned topics may be submitted.

A one-page abstract together with a brief personal résumé should be sent before November 1, to Harold Weiss, Program Chairman, Automation Training Centre Inc, 11250 Roger Bacon Drive, Reston, Virginia 22090, USA, tel: 703-471 5751. Further information on the conference can be obtained from John J. Sheehan at the Institute of Internal Auditors Inc, tel: 305-830 7000, ext 227.

THE exhibition of the microfilm and micrographics processing industry, Microforum 76, will take place next year at the Wembley Conference Centre on June

13-16. It is organised by the British Equipment Trade Association, the national body of the UK office equipment industry. Further details from BETA, 18 Kingsway, London WC2B 6PU, tel: 01-439 6233.

THE next word processing exhibition will be called the International Word Processing Exhibition and Conference, and will take place at the Wembley Conference Centre on June 8-9, 1978. It is organised by the Business Equipment Trade Association, the national body of the UK's office equipment industry, and will be twice the size of the previous event. For further information contact Hart, Brown and Curtis Ltd, 28 South Street, London W1X 1DB, tel: 01-439 6233.



THE theme of Eurocomp 78 will be Information Dynamics, and the conference will set out to examine computer-based information systems in regard to recent developments in distributed processing, database organisation, computer networking and data protection legislation. The conference is organised by Online, with a steering committee which includes Carl Hamer, ICCC representative and Usak's director of computer sciences at West London, Andrei Ershov, professor of computer sciences at the USSR Academy of Sciences, and Christopher Layton, IIC representative and Usak's director of science and technology director. It will be held in London on May 9-12, 1978. For further details contact Online, Usak, Usakridge Uffs 2DD, tel: Usakridge 30202.

AMONG the conferences organised by the IEE this year are an international conference on distributed computer control systems in the University of Aston in Birmingham, September 26-27, and a conference entitled New Developments in Automatic Testing at the University of Aston, November 30-December 2. Further information for Announcements, Cunningham-Swendsen, 111 Press and Public Relations Office, tel: 01-240 1871, exts 272 and 280.

COMPUTER WEEKLY

The following special supplements are due to be published during

AUGUST/SEPTEMBER

DISTRIBUTED COMPUTING FEATURE August 25th

Distributed computing - what does it mean? Is computer technology ready for it? What are the security problems? How are users going about implementing distributed systems? Answers to these questions will form the basis of a Computer Weekly supplement on Distributed Computing on August 25th, when users, suppliers and consultants will put their cases for and against the growing industry trend.

INTERNATIONAL EDITION + BONUS CIRCULATION

SICOB PREVIEW September 8th

In September, Paris switches from its August holiday slumber to bustling leaves and SICOB, one of the major European computer shows.

Computer Weekly, of course, has no summer rest and our International Issue on September 8th will be filled with its usual wide ranging coverage of the world computer scene, including a special preview of this year's SICOB Where Computer Weekly will be exhibiting for the first time and additional copies of the special issue will be distributed from our stand. With an overall distribution of over 85,000 (J.C. 73,773, Overseas 21,248) this issue will provide an ideal opportunity for expert advice on the latest products, equipment and services to the entire audience of decision makers throughout Western Europe.

LONDON AND WESTERN
Stephen Measures 01-261 8263, Tony Kinnaird 01-261 8022, Steven Mehl 01-261 8106, Lloyd Collins 01-261 8757.

MIDLAND
Ken Parrott 021-358 4838

NORTH AND SCOTLAND
Harry Allan 081-874 4211

Stop Press: Computer Weekly continues to publish more product and recruitment advertising and has a higher fully requested A.R.C. (Advertising Revenue Committee) of 72.5% than any other computer publication. An additional 11,242 regular readers in Western Europe will be in the INTERNATIONAL EDITION which is published the 2nd week in every month except August and December.

OP SPOT

OPERATIONS as a career? Or operations as a starting point to a career in the computer industry?

THE potential entrant to the computer industry, and in particular to the operations division, normally has little knowledge of the career prospects available to him. In many cases he is happy to accept the first position offered, as competition for trainee operating positions is high.

The training and career programme for operations staff is developing into three broad categories in the UK. The first category, and apparently the largest, is companies which recruit operators, usually with at least 12 months' experience, simply to operate their computer systems. They may be promoted eventually to shift leader level, but further promotion is unlikely.

These companies consider recruitment of staff a tedious chore, and are apt to recruit computer staff in much the same way as they handle other staff, such as lathe operators and machine operators. Few personnel departments have the expertise to assess the potential of prospective computer staff.

The chief culprits of this method of recruitment tend to be the larger industrial and manufacturing industries, although they exist in most avenues of the computer using world.

The second category consists of users who have realised the potential of the operations department in providing a thorough grounding for a career in the computer industry. This type of firm tends to be the small to medium sized company, with a growing commitment to its data processing section.

Operations staff are actively encouraged to progress from operations into one of many other computer disciplines, such as technical support, programming or systems analysis. Facilities also exist for movement into a user environment area.

The third category, which has existed for many years, concerns the larger companies which offer specific training courses encompassing programming, systems work, and sometimes operating. Invariably this type of course is closed to non-graduate staff. This category of user is aiming to fill a specific requirement for a given number of development staff each year, and it could be argued that he is creating an "elite" section which is able to understand the complex problems of data processing, but does not have a complete understanding of the basics.

The prospective entrant to the industry must be aware of the pitfalls which await him if he is a career-minded person. The first category user, who recruits merely to fill a specific vacancy, and offers poor career prospects, may claim that he offers career prospects, but it is essential to the trainee that he ascertains to his own satisfaction that the company does offer a training course, with ample opportunities for promotion to those able to accept the challenge.

If an employer does offer a career scheme, then he will probably be keen to encourage the applicant to spend some time talking with staff already employed. This provides additional information to both the company and the applicant.



Meet the marathon man: Computer manager Tony Campbell, according to his company, bureau and systems house System Aid, has just watched his ICL 2903 clock up 10,000 hours' live operation. The company reassured us that they were not consecutive hours, although Campbell himself put it wearily, "Running on two shifts with only one operator at a time, we feel we know how to get the best out of both the machine and our people."

Siemens aims for office market

FOLLOWING the lead pioneered by ICL with the 2903, Siemens is recruiting staff for a major thrust into the small business systems and office markets.

The company has already announced a business version of the 300 series minicomputer, called the Sicom-10, and a word processing system, the Siemens 580.

The German paper Computertechnik suggests that Siemens might also introduce a stand-alone version of its Transdata 920 floppy-disc-backed terminal system.

Siemens' chief interest is in winning a larger share of the business generated by distributed systems communicating with a mainframe.

Scicon wins North Sea gas study

MANY of the North Sea oil and gas fields are too small to justify the cost of their own gas collection and processing systems. But, recognising the potential value of the gas which is released as a by-product of oilfield exploitation, the government has prohibited the time-honoured process of burning it off.

The problem of economic recovery remains, and a company, Gas Gathering Pipelines, has been formed to study and report on the viability of collecting gas, and gas liquids, by means of a network linking all the small fields.

Appropriately it is Scicon, the consultancy and bureau owned by Britain's biggest oil company, BP, which has been called in to assist with the study.

Scicon is developing mathematical models to analyse the best way of putting together a pipeline network to feed the gas from several fields to an on-shore processing plant.

Bus scheme

A PILOT scheme to computerise communications between central controllers and bus drivers has been put before the Greater London Council by London Transport.

The £250,000 scheme is a precursor to an estimated £10 million project to improve the efficiency of the London bus network.

A trial system is currently in operation using a microcomputer on a bus to provide the controllers with scheduling data by a radio link.

Three Rs come before computers

—SAY COUNCILLORS

PLANS to upgrade a college computer at a cost of £12,000 so that secondary schools can use it, have been criticised by local councillors in Hillingdon, Middlesex, who say the money should be spent on improving primary school teaching of basics like reading, writing and arithmetic.

The access which 14 secondary schools now have to a computer is limited to a weekly turnaround from Westfield College.

But a Tory councillor, Phil Sawyer, who favoured spending the money on more basic edu-

cation, said the facilities provided by Westfield College and Brunel were sufficient: "There is not one child in the borough who will be deprived of computer education if we don't go ahead with the scheme."

The council argued that present services were not good enough to support project work, which forms an important part of CSE courses run by the secondary schools.

The enhancements are due to be installed in October.

Datev bureau orders 3033s

THE big German tax bureau Datev, which claims 12,500 of the Federal Republic's 30,000 tax consultants, has ordered two of the big new IBM 3033 mainframes. It now has two 370/168s on long-term lease, and will buy one of them outright. The first 3033 is needed next year, but Datev expects that it will have to continue running the 168s for two more years.

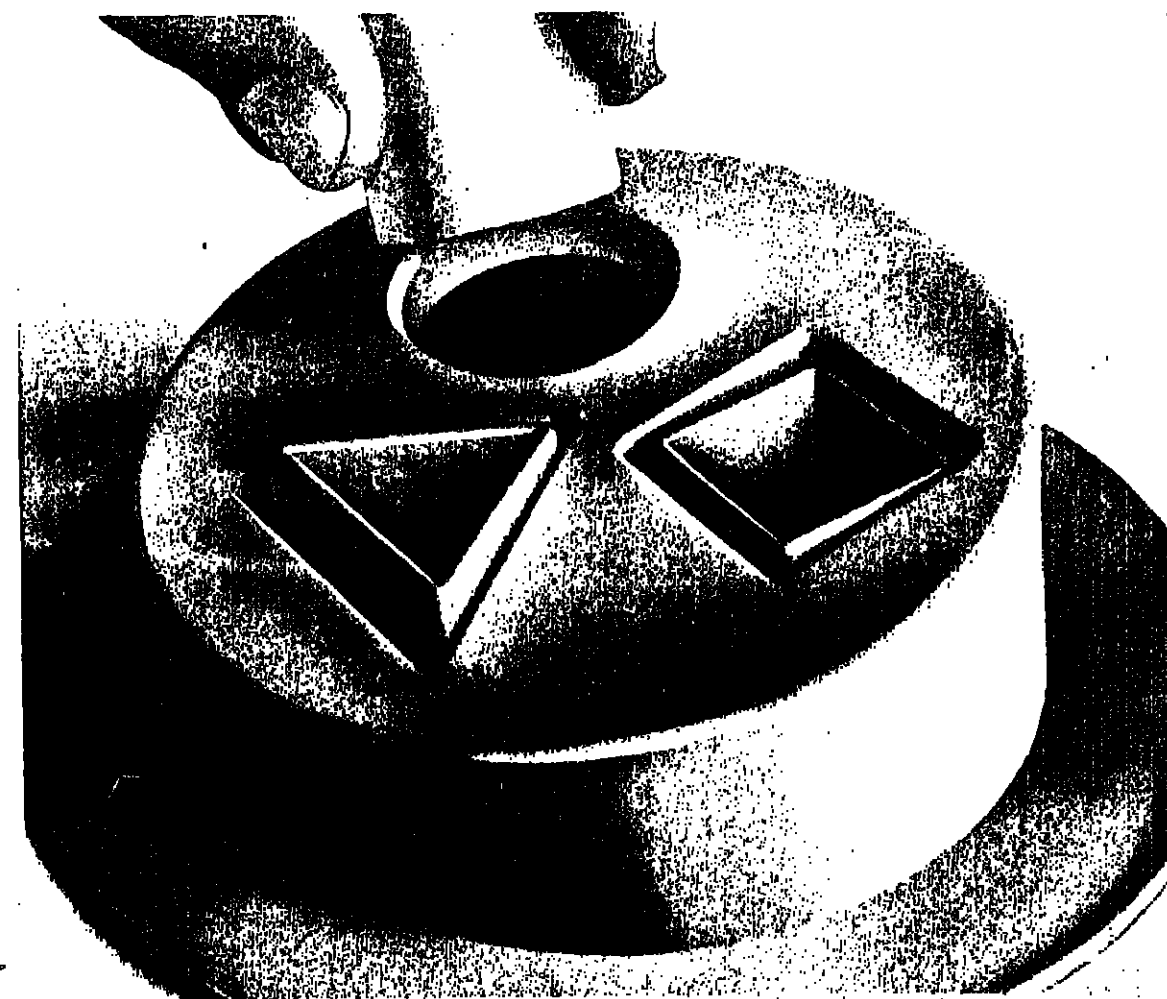
Forty firms show their wares

COMPUTER applications for electronic displays will be the main theme of a two-day seminar to be held at the Mount Royal Hotel, Marble Arch, on September 6 and 7 as part of Electronic Displays 77.

The event also includes an exhibition of display equipment, running from September 6 to 8, involving about 40 firms.

The first day of the seminar will be devoted to computer graphics devices, systems and software. The second day concentrates on display components, including liquid crystal displays, LEDs and AC and DC electroluminescence.

The complete seminar costs £45 plus VAT.



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Argus 700 the system man's computer.

Defining 1.5A

FILE DESIGN

Part 8

By Owen Hanson

Special purpose files

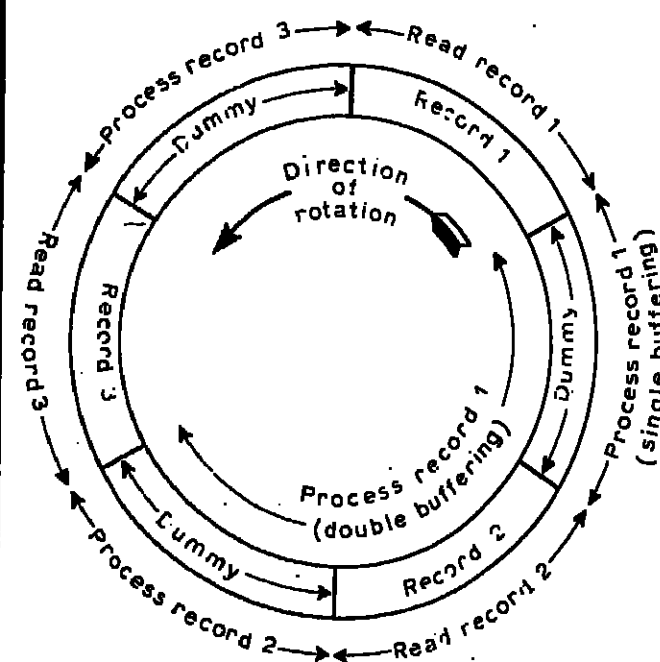


Figure 1. The arrangement of data records and dummy records on a track to ensure that no time is wasted due to rotational delay. If double buffers are used, Record 1 is available for processing and writing back until Record 3 is read.

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Our illustration shows a BBC Research Department design for a ferrite rod aerial that receives v.h.f. and fits inside a portable radio set. It eliminates the external telescopic whip aerial, which has to be drawn out and adjusted, and so makes portable sets easier to use. You can read about this unique development in our September issue. Just one of the many 'break-through' articles you'll find in Wireless World, the comprehensive electronics journal. Another is a design for a very high quality laboratory oscillator, used for testing audio equipment, with a distortion level as low as 0.002%.

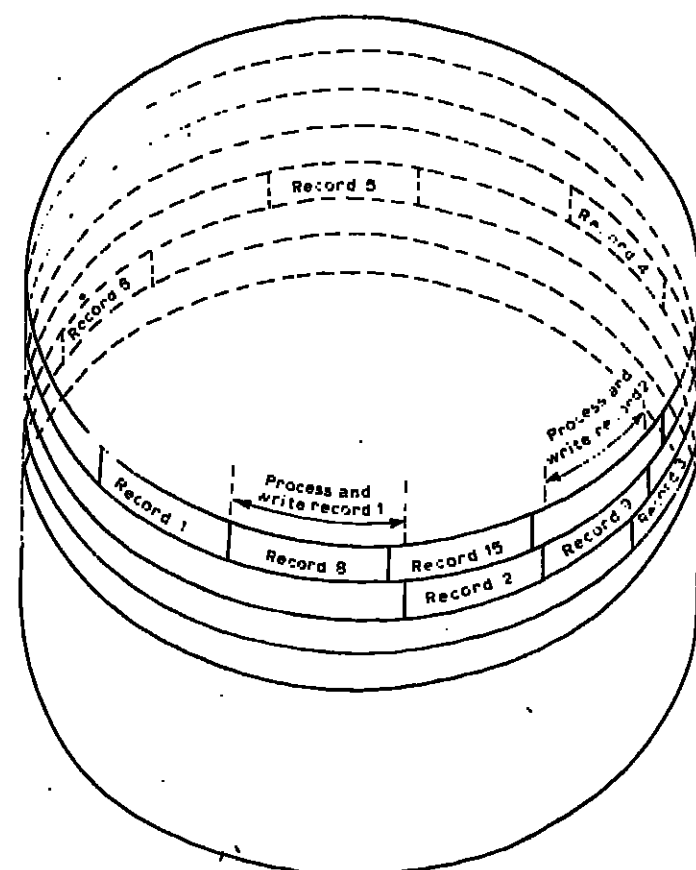


Figure 2. Records are arranged in a spiral pattern, the first on track one, the second on track two, and so on, until rotation of the disc allows a further record, in this case the eighth, to be placed on track one.

The first is that they are device dependent, and their performance can be ruined by transfer to another device.

The second is that the processing involved cannot be varied, once the file is "tuned" to give optimum performance, no additional jobs can be carried out without re-designing the file to adjust record positions. This means that such files are only suitable in a few cases, and are always "brittle" and invariable.

The second class of specialist files is very different. In recent years the use of computers in production control, production scheduling, calculation of materials processing requirements and the like, has become an important part of data processing.

Applications of this type often require complex chained or linked files. A reference to a particular machined part, for example, can be used to provide a list of the processes it passes through in the course of manufacture, or a breakdown of the assemblies it is used in, and in what quantities, in the manufacture of a finished product.

The user systems analyst responsible for such an application will be more involved in choice of alternatives than in true file design. Each manufacturer offers a distinctive set of products, and familiarity with a given package will allow the user to choose a minimum set of options that meet his requirements.

Variation of these options will allow an application to be effectively tuned, but it is important to start from a known base, and the minimum option set is the most convenient.

A serious trap lies in wait for the systems analyst here. It is best illustrated by an example. CLASS, Capacity Loading and Scheduling System, is used to schedule work more efficiently, and to reduce the amount of work-in-progress, WIP, on the shop-floor.

Management see WIP as capital and added value lying idle in the factory. The individual machine-minder sees it as his guarantee of there being a job for him next week. Unless he is convinced a system that cuts WIP will benefit him, shop-floor morale is endangered by any such system.

One company that installed CLASS found that initial reductions in WIP were followed by a general reduction in productivity followed by restoration of WIP to levels similar to those that applied before CLASS was installed.

Several cycles of this type were followed by the removal of the CLASS program from the installation. However, the failure was not a technical one. The systems analysts responsible for the program had not communicated with shop-floor workers, and failure was the price of this omission.

The file designer is not only responsible for the technical side of his work. In addition, he must allow for its impact on other members of the organisation, and ensure that they expect, and accept, the changes his work will cause.

NEWS IN BRIEF

Fifty lose print jobs

ABOUT 50 production workers at Scottish and Universal Newspapers, one of Scotland's biggest newspaper groups, are to lose their jobs following a decision to shut three printing centres at Paisley, Kilmarnock, and Ayr and move to a £1 million computerised plant at Irvine, New Town, in Ayrshire.

The new plant will have photo-typesetting and web-offset facilities.

REDIFON Flight Simulation has sold its second civilian helicopter simulator to Helicopter Service A/S, of Stavanger, Norway. Based on a Redifon 2000 computer, the Sikorsky SH60 helicopter simulator will incorporate Novoview SP1 night and dusk visual graphics, and a six axis motion system.

TWO GEC 2050 RJE terminals have been installed by British Airways at Heathrow Airport. They are used for communicating with the IBM 370/150 at Bodelice House.

THE US-based manufacturer of magnetic tape drives for mini computers, Digi-Data, has set up two subsidiaries in Europe. These are based at Brugge in Switzerland and at Maldenhead in UK. The Swiss company will sell directly in Switzerland and Germany and through distributors in France, Italy and Spain. The UK subsidiary will control distributors in Benelux and Scandinavia.

AN online version of SECURE, a financial computer system originally designed by Lazard Brothers to handle contract calculation and maintenance and accounting for clients' investment portfolios, is to be marketed by CMG (City of London).

A TOTAL of 2,400 Avery 179 digital weight scales have been ordered by Woolworth and Dewhurst from W & T Avery.

A DATABANK proposed by the Confederation of British Industry for use in advising companies on the best level for wage settlements during the next round of wage negotiations is to be a completely manual system, and according to the CBI, it will be more a counselling service than a monitoring one.

PLANS for the House of Commons library computer system, as expected, did not progress any further before Parliament rose for the summer recess. An attempt was made to have the proposals of the Joint Lords Commons committee on the topic accepted, without debate, but this failed.

TYNESIDE machine tool manufacturer Noble and Lund has ordered a £10,000 viable record computer from Philips Data Systems. Extensive use of the Philips Software Library is planned.

A GENERAL Automation engine test-bed automation system has been installed by Mobil Oil at its Research and Technical Services Laboratory at Coryton, Essex. It features a GA-16/440 mini which is used to control a multi-engine test bed as part of Mobil's research and development programme.

A GEC 4070 processor will shortly be installed at the GEC Technological Centre in Warrington. Equipped with 16 kilobytes of core store, it will replace the existing 4070 system.

COMPUTERS AND ACCOUNTANT

Accountancy, one of the most respected professions, is traditionally linked with book-keeping — looking after the ledgers, working out the payroll.

But the introduction of computers not only makes the accountant's job easier in these traditional areas but opens new paths in the fields of financial modelling, corporate planning and costing.

As John Ambler says in this opening article, accountancy departments are ideally suited to computing because they are already well structured,

disciplined and used to working to high levels of accuracy.

This supplement looks at old and new applications, for computers in accountancy departments. Ambler sets the scene with a look at the growth of the use of computers by accountants, a review of some of the common applications and a glimpse of the future, while other writers describe systems handling applications ranging from pensions to modelling and royalties for pop groups.

Applications wheel turns full circle

By John Ambler

THOSE of us with a long tooth in computing can recall with ease — and occasionally affection — those far off days when the computer was the accountant's toy. The financial director or chief accountant was considered the "natural" man to handle the computing activity: as one MD said, "he is the figure man isn't he?" as if this was all the justification needed.

It was true in those days that much of the work the computer tackled was accounting: payroll, ledgers, costing and the like. Of course, the real reasons for computerising these tasks were rarely advanced: they were already structured, disciplined activities; the accountant's department had become naturally used to working accurately and against time pressures; and the pay-offs associated with large staffs and volumes and non-fragmented jobs were substantial.

The wheel has well-nigh turned full circle, at least as far as applications are concerned. In 1960, the post-tax real rate of return was 9.7%, compared with 2.8% in 1976.

Not only are we short of profit, but liquidity is tight and interest rates high. The Price Commission's rules have superimposed a new set of costs on top of "actual costs", "standard costs", and "historical costs" — whatever they are.

Every year brings more requirements in the way of disclosure: segmental accounting, revaluation of assets, and whatever we are required to do for inflation accounting Mark 4.

The number of qualified accountants has decreased to the point where some authorities are asking if there is a natural upper limit to their numbers in any given economy. But it is the unqualified, but experienced, accounts clerk who makes or breaks any accounting system. Both these groups have added weight to the inevitable pressure from the top to computerise more work.

There are maybe 50,000 businesses in the UK with between 25 and 500 staff, who could usefully benefit from running a set of integrated ledgers, together with order entry and invoicing and a payroll system — at an all up cost of say £35,000, including external help.

At the other end of the scale, the top 5,000 organisations could well benefit from the phased changeover to a generalised accountancy package, covering budgets, projects, multi-company groups, foreign currencies,

and the like.

In between, there is enormous scope to profit from the use of models of all kinds.

For a trading organisation, the applications are fairly standard:

- Payroll
- purchase ledger
- sales ledger (including perhaps order entry and probably invoicing)
- general ledger (including budgets, overhead control, etc)
- fixed asset accounting

flexed budget, and can even compute internal service charges. Development in this area over the last five years has been substantial. There are some exceptionally subtle and powerful systems on the market. Here, however, one of the problems is that it is extremely difficult to determine the power and flexibility of such a system from the sales literature.

Fixed asset accounting is an application which has come well to the fore recently, impelled partly by inflation accounting,

their interest and even sidetrack them from more important, if mundane, tasks to a remarkable extent. Accountants beware!

The second user group are the purchase and sales ledger clerks, and their opposite numbers outside.

The third important group covers all those who input or use costs. Nearly all of us are to be counted in this group during part of our working lives.

A final important user group comprises the professional accountant in his auditing capacity.

Accountants have for many years been fascinated by the machinery on offer to solve their technical problems. Investment was once readily made in unit record equipment — data preparation, card sorting, and tabulating. Many accountants then pursued their careers in "information processing."

One of the characteristics of computer development in the last five years is the matching of hardware to local needs. The old organisational rule of "centralise what you must, decentralise what you can" has found application in computing.

The typical manufacturing establishment, even in a large group, does not employ 10,000 staff: 500 is a much more representative figure. Such an organisation has its own rules and procedures, and accountancy timetables.

To meet the real life structure of such large and medium size enterprises, manufacturers are now offering distributed processing, and minicomputers with full accounting software.

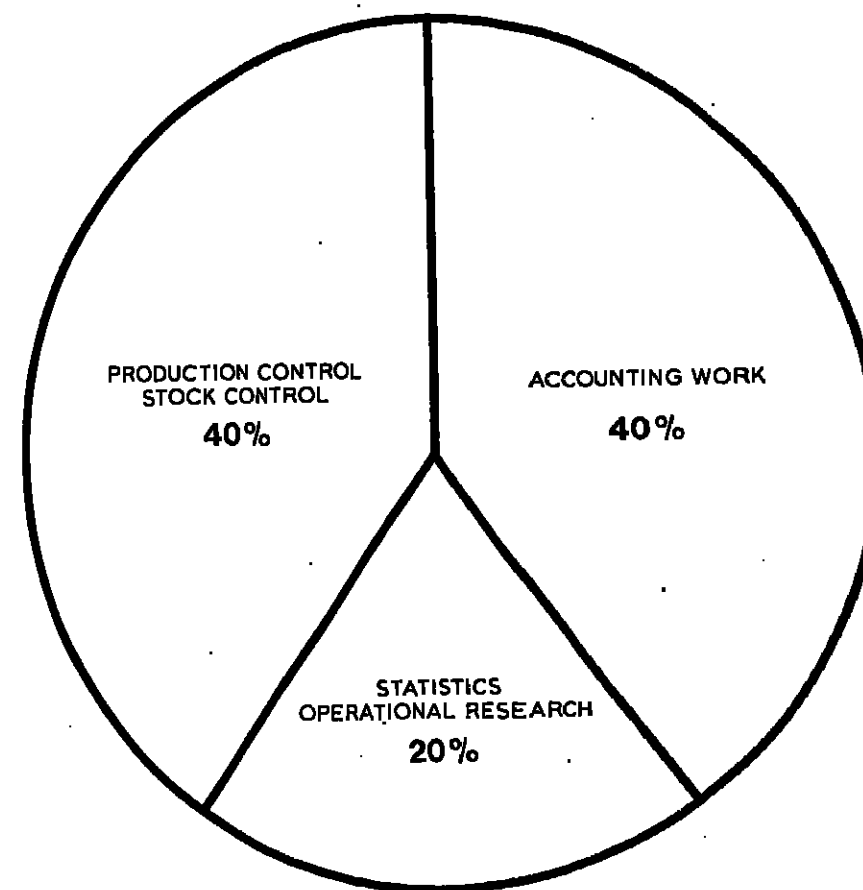
All the evidence points to the fact that the accounting requirements of both large and small firms are growing at the same rate.

Hence the global total of accounting applications: neither directed themselves towards or against large mainframes or local minis.

Undoubtedly, some sad experiences with VRCs will deter some accountants. Still, a buyer of a calculator at £20 which failed is not likely to refuse a machine twice as powerful costing £10.

Such blind alleys are one price of progress. The accountant's judgment must always be to postpone choosing the high technology solution (except at another's cost and risk); and to go for the simple and the proven.

While not an innovator himself, he is often in the vanguard of those following the successful innovator.



Distribution of DP effort, including computer time and design costs.

The 1971 Miles Roman "Computing Usage Survey" showed that accounting applications had a higher success index (0.82 on a 0 to 1 scale) than statistics (0.75) on production control (0.66). These success ratings were higher irrespective of the reporting point of DP in the hierarchy; although naturally financial directors claimed an above average success rate.

Will the high percentage of accounting work continue? Will it continue to have an above average success rate? I believe that the answer to both these questions is 'yes', and here are the admittedly contentious reasons why.

Before computing existed, accountancy was intricately associated with the means of producing accounting data as well as the ends. There has been a period when apparently both professions have diverged. I do not believe they will coalesce, but I do think that the transfer

from one occupation to the other — and back again — is a natural one, and it could well be on the increase.

Accountancy will continue to be an activity which is at once both nearer the detail user (itself a guarantee of above average success) and the strategy making part of the organisation structure.

Finally, the accountant's dominant position in "information processing" is enhanced by the use of DP, not fragmented.

While there are not exactly new applications, there are new starts to old approaches and systems.

Modelling is one area where the sky appears to be the limit: here the accountant, the OR man, and the DP specialist can usefully collaborate.

In the Miles Roman sample, two thirds of firms had computerised nominal ledgers, and only 40% cost ledgers. Existing users have a long way to go.

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Keeping TRACS on pop music business

THE Chrysalis Group has come a long way since it was set up as an entertainment agency in 1968. From specialising in booking rock and roll artists, it has moved through artist management into record production and distribution, music publishing, and recently record studios. But it is for its record activities that Chrysalis is best known.

The early record releases were all progressive or "heavy" rock but the company's recent policy has been to broaden the basis of its product so that now the label has artists like Leo Sayer, Jethro Tull, Steeleye Span, Frankie Miller and Robin Trower.

"Each year we release about 40 albums, together with an equivalent number of singles. The catalogue available from Chrysalis has been steadily accumulating and continues to sell strongly. Aquilung by Jethro Tull, for example, was released in 1971, but it still sells 10,000 copies a month around the world," explains Terry Connolly, Chrysalis' deputy group managing director.

Yet the Chrysalis world of rock and pop is not all glamour. Behind the group's success is an astute awareness of the importance of strong accountancy methods and sound business management, backed by a willingness to make use of the latest techniques.



Steeleye Span is just one of the famous names on the Chrysalis record label. Yet the group's world of rock and pop is not all glamour. Royalty analysis and distribution of income between artists was handled manually, until CMG was called in as consultants. The end result was Total Royalty Accounting System — or TRACS. Apart from solving the workload problem, this system has enabled Chrysalis to provide much more information to artists, writers and producers — as well as to management itself.

One of the biggest problems in the record business is tracking royalty and copyright payments. When an album is sold, a percentage of the revenue is allocated to a number of people: the artist performing the album, the producer, the song publisher and writer. No matter where the album is sold, in the UK, the US or Europe, the income is channelled into Chrysalis for distribution.

For a number of years all this royalty analysis and division between artists was carried out manually, while the overall accounting function was dealt with by an NCR accounting machine. But as the group expanded it became increasingly difficult to handle the workload. It was decided to bring in a minicomputer and CMG was called in as consultants. Part of the brief was to consider a

bureau service for all operations. CMG recommended that a bureau system should be developed to handle royalties and copyright while the accounting routine should go on to an office computer.

For this work a Kienzler 2000 was installed and this handles bought ledger, credit transfer, VAT summaries and payroll. It is also used to produce analyses of company operation and credit control. After accepting CMG's recommendations and moving away from installation of a mini computer, quotes were obtained for development of the bureau royalties system. "We stayed with CMG and the end result was Total Royalty Accounting System, TRACS," says Terry Connolly.

The impact of TRACS on Chrysalis was remarkable.

Apart from solving the workload problem, the system enabled the company to provide much more information to artists, writers and producers, as well as to the management itself.

From reports produced at CMG (West End), managers obtain an up-to-date picture of album sales by territory, broken down under such headings as amounts due to each artist, summary of sales and receipts and so on, analysed from information held on master files at the Croydon data centre.

In common with the majority of computer users, Terry Connolly was intent on gaining the potential benefits of the system as economically as possible. One of the best ways to do so is to use a package — a ready written programme of which development costs have been shared by a number of customers.

Unfortunately TRACS had to be developed right from scratch, and the final costs promised to be quite high. So it was decided that the system would be specifically written in a package form

that would handle royalties, copyright and music publishing for a range of organisations in businesses similar to Chrysalis. TRACS would then be marketed as a joint project between Chrysalis and CMG.

"This arrangement had two effects. First, it enabled us to recover a proportion of the development costs. And second, it added a strong sense of discipline. It stopped us from becoming self-indulgent in the type of information we wanted from the package. Everything produced is of value. We had no room for frills," added Connolly.

This approach has certainly proved successful. Apart from Chrysalis which uses it to account to 50 artists, numerous producers and several hundred writers, TRACS is running as a bureau service for a number of other organisations such as United Artists, Virgin Records, Anaktara and RAK Publishing.

The package itself is divided into three separate modules — TRACS 1, 2 and 3 — which may be run separately or linked together.

TRACS 1 covers artist royalties. It converts all revenue into sterling regardless of currency type and calculates the amount due to each artist and producer. Artist/producer royalty statements, a summary of the amount payable for each album together with a total by each artist, and a breakdown of sales by territory for each album, are

all supplied automatically.

TRACS 2 — the copyright system — calculates the copyright due for each track and prints copyright statements for each publisher or writer, as well as a summary showing the amount due.

TRACS 3 is the music publishing system that calculates the amount due to each writer, automatically applying any of the five different percentages according to the type of track. The computer then produces writer statements, a summary of receipts by song within writer, and a summary of the amount due to each writer or account.

Since the system went live in 1975, it has been further improved by the addition of supplementary reports such as analyses of expected and outstanding payments on a particular song and a cumulative sales report. Clients also have the option to produce selective statements, returns, artist and producer summaries and a condensed album catalogue. Other items include foreign currency statements and reports, as well as lists of albums, songs, artists, writers, publishers, licensees and territories.

Connolly is now looking towards marketing TRACS in the US and Europe. "It is already available on the Continent but we would really like to market the system in the US. There are hundreds of smaller record companies and publishers that could well make use of TRACS now that it is fully operational."

FROM the earliest days the accountant has seen the computer as an important book keeping aid. Indeed, it is frequently said, with truth, that many organisations could no longer continue to function without their automated invoicing, credit control, purchase ledger and payroll systems.

In the more "advanced" companies much of the data required, updated and produced for these applications is integrated to enable detailed management information to be presented over a wide range of their activities.

Yet comprehensive as many of these systems are, they really only represent a start to realising the computer's potential as an aid to planning and running a company in an increasingly complex world. For today many factors that are completely out of a company's control can affect the business to an astonishing extent, for good or ill.

For example, how many accurately forecast, four years ago, the explosion of energy costs and its effect on their business? And how many understand the effects that are likely if current wage and salary claims from various sections of industry are met in full or, indeed, if partial settlements are reached?

Answering questions such as these, and the hundreds of the more mundane but equally valid ones that in some way affect every organisation, within a timescale that enables appropriate action to be taken, provides the computer with a vital role in business development.

The idea of producing a corporate model and then asking a series of "what if?" questions is by no means new. The techniques involved have been used for many years in the process control environment and are well tried and proven. And an increasing number of organisations are now applying them to the company as a whole in a bid to evaluate the alternative courses of action open to them.

There are a number of reasons why business modelling and forecasting is now gaining momentum. For a start, the money "at risk" if a mistake is made has increased out of all proportion during the last few years. And, as a result of the pioneering efforts of a number of enlightened companies, there is now considerable experience in designing and implementing corporate models.

Equally importantly, a variety of databases are now becoming generally available, enabling the user to "project" his company against economic and industrial trends. In this way he has access to accurate up-to-date information which would be prohibitively expensive for an individual company to obtain and to maintain.

One of the earliest commonly available systems was the Share Price Databank which holds five years weekly data on share price, dividend yield and the P/E ratio. This has proved remarkably accurate in spotting trends and, because it uses essentially the same techniques, can be considered as a highly successful prototype for the later, less specialised models now being used for a wide variety of economic forecasting.

One of the most important of these is the Treasury Macroeconomic Model which is currently used by the Treasury to provide forecasts of the UK economy for up to two years ahead, with medium term assessments of up to five years ahead. One of its key roles is in the measurement of the sensitivity of the economy to policy changes, enabling more efficient and rapid judgments of the effect of government budgets and new legislation.

The model itself contains more than 800 variables and several hundred equations, including both identities and empirically fitted casual rela-

Corporate modelling to aid business and financial projection

By Nigel Chidley

It is now possible to go to a bureau, produce a corporate model of an individual company, and obtain the likely effects of items such as government legislation, says Nigel Chidley, manager of the Business Systems Division of Scicon Computer Services.

He also points out that actual performance can be monitored against forecast at frequent intervals, and the business plan altered to take account of the changes.

changes in the criteria and pressing a button. And the answer can be received as a tabulation, a line plot, scatter diagram, a histogram or, indeed, in virtually any form required. All that the operator requires to know is the capability of the system and the questions he wants to put.

The use of terminals and the availability of databases means that the research department of the large organisation is now

able to concentrate on the interpretation of information instead of spending most of its time simply collecting it.

And the smaller company, which does not have the resources or the desire to afford the high level of expenditure previously required, can now obtain the benefits of business modelling at economic rates. For most managing directors know exactly what information they require for their own corporate

plans but have not previously been able to take into account the wider implications of outside factors.

However, it is now possible to go to a computer bureau, produce a corporate model of the individual company, and obtain the likely effects of items such as government legislation. Just as importantly, actual performance can be monitored against forecast at frequent intervals, and the business plan

altered to take into account the changes.

Today the role of the accountant is more than that of a book keeper. He is required to advise and implement over a wide area of financial management and planning. With business modelling and forecasting systems, the computer industry is proving its awareness of his problems, and providing the means of dealing with them.

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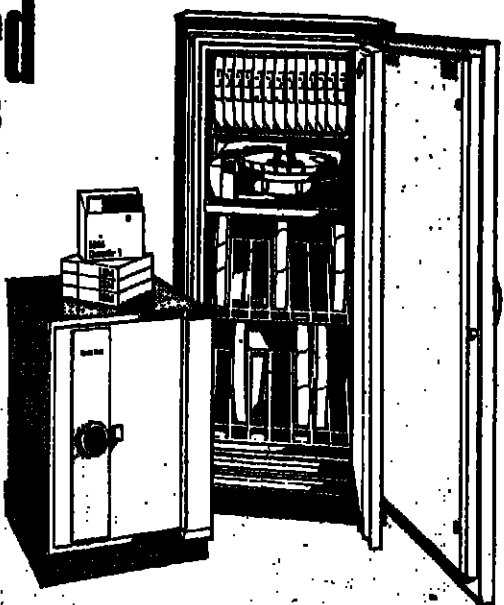
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Streamline paperwork to give better service

AIDS (Accounting Information Development Service) which provides a computer based service for accountants in both practice and commerce, is a company run by three young chartered accountants, Mike Salinger, Peter Rance and Laurence Scodell. They believe they are the only accountants wholly employed in this area of work, and are particularly concerned that practising accountants improve the profitability of their practice by providing a far more prompt and efficient service to clients.

The service is based on the principle of regular accounting, wherever practical, thus providing accountants with a basis for regular billing, and clients with up-to-date information. AIDS operation is run from their Grays Inn Road offices, and has been based upon card punching data preparation, but due to the rapidly expanding volume of business they are looking forward in October to changing over to the Rediffon Seescheck system.

The company is conscious of the need to reduce the superfluous paper that many systems produce, although every effort is made to ensure that all reports and printouts are produced in duplicate and presented to clients in specially designed binders and folders.

AIDS services are essentially for businesses which are not in a position to contemplate having their own in-house hardware. Most of these small and medium-sized firms are using

either manual or basic mechanised accounting systems. AIDS recognises that in these inflationary days, bookkeepers' and accountants' time should not be involved in unnecessary manual analysis, ledger postings, etc.

Thousands of businesses in this country are required to keep books of account for Customs and Excise, the Inspector of Taxes and their auditors, but very little use is being made of the information by the business itself.

Through AIDS' association with the Accounting Corporation of America (ACA), which services more than 2,000 firms of accountants in the US, they have learned the need for a flexible coding format to keep pace with the requirements of the many types of clients that need regular accounts.

The businesses vary from schools, holiday camps and newspapers to restaurants and pop groups. The flexibility of the service provides clients with their own chart of accounts, and a personalised presentation of their financial reports.

The main reasons that most accountants are unable to service many of their clients are:

● They are overworked due to the external pressures put on them by government legislation, for example the filing of statutory accounts within 10 months of the end of each company's financial year, the necessity to submit VAT returns within one month of every quarter and new regulations concerning the submis-

sion of personal tax returns;

● The shortage of good and experienced clerks is causing an acute problem due to the escalating salaries that are necessary to attract them, and

● Due to the high turnover of staff clients often find that different clerks are preparing their accounts each year. The only continuity is the partner, who is usually overburdened with clients' problems.

During the next two or three years accountants must commit themselves to improving the service available to all clients. Businesses generally suffer greatly from lack of financial and management advice.

Accountants are capable and properly trained, but do not have adequate information to make the necessary decisions or forecasts to assist when required. Practices should gear themselves up to providing more of their clients with regular accounts, monthly, quarterly, etc., by spending a certain amount of time improving the clients' bookkeeping/accounting systems to produce automatically the necessary detail. It is unacceptable for clients to bear the cost of a clerk at £7 or £8 an hour where, with a little more thought and expertise, the client could be balancing his own books and preparing his own accounts.

Unless accountants can streamline the mass of paperwork that is flowing in and out of their offices, they are not going to be in a position to service their clients regularly and efficiently.

WHEN pension schemes started, they were, looking back, very simple to run. As time passed, sophistication crept in. Design of benefits became increasingly sophisticated and tax concessions increased. Simultaneously, governments became more concerned about pensions because of social implications.

Today running a pension scheme can be a complicated business. Not only is it necessary to have at your fingertips details about current members and current benefits, but also information about previous schemes in which members were involved and details of persons who have retired or left your service.

Quite clearly the storage and retrieval of large blocks of information is ideally suited to computers. Sedgwick Forbes Employee Benefits Consultants, a specialist company within the Sedgwick Forbes Insurance broking group dealing with pensions and other employee benefits, has a computerised administration system for administering pension schemes, both for its own use, and for sale for use by other companies.

They had for some time administered pension schemes on a manual basis. There was no file maintained with all the data held and regularly updated. The system worked effectively, but as reports with updated infor-

Computerised pensions administration

By Gershon Lipschitz

mation were required each year, it meant that all the data had to be fed into the computer each year to produce a report. Added to this was the fact that major Social Security legislation was due to come into force in April 1978.

The legislation required that in a number of cases it would be necessary to have data which should be available from the

Department of Health and Social Security. Sedgwick Forbes, in common with most other consultants, was sceptical about how quickly this data would be forthcoming, and so decided that they must be in a position to produce the information for themselves.

Because of time restrictions — the system would have to be operational by the end of 1977 at

the latest — it would have made sense to buy a package, but no such package existed at the time. So, in conjunction with Pensions and Insurance Computer Services — a special pensions software house — a system was designed and is now operational.

There were a number of problems to overcome at the design stage. From the pension

point of view, the system had to be broad based enough to be able to store information for a number of differing pension schemes, for Sedgwick Forbes' own use, and be adaptable to other people's pension schemes. In order to obtain complete flexibility the concept of a "scheme module" was created. The "scheme module" described the features special to each scheme and is accessible to a number of different programs. One module is written for each scheme. The result is a system wider than one purely parameter driven.

Each member can have a record which, if all possible variations are present, is quite long. By putting all the information on file, all data can be used because it is readily accessible. This is a very useful tool, not only for pension administrators but, if the necessary details are on file, and there is room for them, for personnel departments too. This is an area which is not often appreciated, and one central source of group personnel data is often ignored, or its usefulness goes unappreciated.

The system differs from the usual insurance company administration, which is normally geared to the features of that company's operations only. It is fair to say that any pension scheme's records can be stored, retrieved and manipulated on the Sedgwick Forbes' system. This is its unique feature.

There were also technical problems. Should the files have random access, or should it be accessed sequentially? There are advantages in both but it was eventually decided that operating in sequence was the answer. Should files be held on tape or disc?

During the writing of the system, a major job, it became apparent that the system would be larger than originally envisaged. When completed it contained over 20,000 procedure division statements.

All information necessary to run a pension scheme is held on file. Collecting the data and then ensuring its accuracy is always a problem. It is amazing how much information which should be known, is not available.

There are a number of error indicators and warnings thrown up in editing input, some of which are generalised (for example, that a supposed month number is in the range 1-12) and some of which are scheme specific (a certain data, say the date of entry to a scheme must be after, say, January 1, 1960).

Each year, or more frequently if required, the file is updated by putting on information which changes, such as salary, deleting those members who need not be on file and inputting new entrants. It is possible to use details produced for other purposes, eg, for the Inland Revenue or DHSS, to update "existing members" records. Other changes are also recorded, such as change of status, change of name (for married women), divorces, deaths, etc. Members' "contribution" histories are up-



Running a pension scheme can be a complicated business, says Gershon Lipschitz, who is assistant director of Sedgwick Forbes Employee Benefits Consultants. Here he describes how his company set up a computerised system for administering pension schemes, and he looks forward to April 1978 — "a watershed in the pensions world."

Lipschitz was educated in South Africa, and worked for an insurance company there before coming to the UK in 1970. He was with a leading firm of consulting actuaries before joining Sedgwick Forbes in 1973, and he qualified as a Fellow of the Faculty of Actuaries in 1972.

dated, and where appropriate interest credited. Updating can be done as frequently as necessary.

If a member changes status for instance leaves service but retains a frozen pension in the scheme, and say then dies leaving a widow's pension to be payable (another change of status), records are held on the file all the time, and the change is easily dealt with, both in terms of changing the file, and in keeping the scheme administrator informed as changes go through.

Reports are produced. These would include details of "live" members, deletions from the file, changes to the file, retirements due to occur in the next two years, deaths that have occurred and any other special reports required. Ready production of this information enables the administrator and the company to be in full control of its pension scheme. Extracts can be taken off the file for use in actuarial valuations. Where a computer file is not held, production of such data can be an arduous process.

The production of individual employee benefit statements is a natural by-product of such a system. These are statements issued on a regular basis which inform the member of his own benefits under the scheme. This is not in fact done directly by the system itself though, of course, it could be, but, by means of an extract, separate programs do the work. These programs produce benefit statements as part of an existing system within the data processing department. Without having the information on a computer, this would be quite difficult.

Future developments are already planned. April 1978 is a watershed in the pensions world. Thereafter, the system will be extended to do benefit calculations for individual members at the time of retirement, withdrawal or death. It will be desirable to have a standardised interface with the main payroll systems — Unilever and Q-Pack. From there, who knows?

This system has been written for an IBM machine. It could be ported to other machines.

'Set up a national CAL centre' call

NEW manufacturing and business methods and changing patterns of employment could create new opportunities for computer assisted learning, but unless there is a dramatic change in organisations' attitude to CAL, industry will lag far behind education and military training in these methods in the 1980s.

So says a report* on computers in industrial training and management development, produced by the National Development Programme in Computer Assisted Learning.

The problem, said the report, is that industrial training has relatively little experience of CAL and has hardly begun to exploit its potential.

The report gives several reasons for this: industrial training is a vast unco-ordinated field where innovations cannot be spread easily. Early exaggerated claims that CAL could replace teachers have created suspicion of these methods. Few training departments have enough computing experience. And commercial interests such as demand for minimum costs and immediate results, together with the existence of cheap audio-visual aids, make the current attitude to CAL "not too surprising".

The reasons add up to lack of

knowledge of the potential of CAL, and the report calls for the creation of a national centre to collect and hand out information and, if enough money is available, to pilot applications and co-ordinate research.

The need for CAL techniques is clear, according to the report. There is a growing use of computers in industry, a greater need for planning, fault finding and problem solving skills, and a demand for maintenance and

Plato on show

The computer aided instruction system Plato, developed by Control Data, will be available for demonstration in the UK in October. And next year a Cyber mainframe will be installed in Brussels to handle a European service. UK marketing is being handled by Neil Spoonley, formerly director of the University of London Computer Centre.

Roger Miles, assistant director of the national programme and author of the report, said there was very little published material on US systems and that no data on their cost-effectiveness was available.

Computers in Industrial Training and Management Development in the 1980s, by Roger Miles, 37 pp. 75p. National Development Programme in Computer Assisted Learning, 37-41 Mortimer Street, London W1N 7RJ.

process control skills as automation and sophisticated technology change the manufacturing and production industries.

At the same time, as manpower becomes more expensive, there is a need for training systems which develop individual abilities fully, and quickly react to weaknesses to avoid wasted effort.

In all these areas CAL has proven through systems deve-

Go-ahead for AT&T switched data service

THE US Federal Communications Commission has authorised AT&T to go ahead with a switched data service which would compete with the services offered by "value-added" carriers like Telenet.

Called Dataphone Switched Digital Service, DSDS, the AT&T system would link 27 cities carrying data at 56K-baud only.

DSDS is unrelated to the Bell Data Network which AT&T is planning. This would allow users to communicate with the network using a very high level

language, and would involve AT&T in large amounts of DP.

Contesting AT&T's application for DSDS, Telenet asked that the company be required to set up a separate subsidiary to run it. The FCC ruled that this would be inappropriate for one service, but is considering whether AT&T should form a separate subsidiary to handle all its data services.

"Our submission was not rejected," a Telenet spokesman told Computer Weekly. "We believe that the FCC is moving in the right direction."

Nixdorf plans D116 replacement to be made by US subsidiary

PREPARING for the day when Data General phases out production of the D116 minicomputer — expected to occur once existing orders are completed — Nixdorf is planning to use its newly acquired US subsidiary, Entrex Corp of Burlington, Massachusetts to manufacture an alternative to the D116.

Entrex manufactures key-to-disc systems based on the D116 and Nixdorf also uses the mini in small versions of its 8870 business computer.

Uncertainty over the future of

the D116 following Data General's acquisition of its originator, Digital Computer Controls, persuaded Nixdorf to design its own processor, which is code-compatible with the D116.

Data General acquired DCC, thus ending a series of law suits in which it was alleged that the D116 was an illegal copy of the Data General Nova 1200. Data General is now investigating the Nixdorf-designed mini to determine whether it has grounds for a similar law suit against Nixdorf.

Zilog software package

ZILOG has introduced a complete graphics software package for the Z-80 microcomputer system, or any system using the Z-80 based family of microcomputer boards.

It offers the generation, printing and display of complex images comprising any combina-

tion of vectors, points and variable location characters with user-definable shapes and sizes.

For hard copy output, the package is designed for use with a low cost printer, having a resolution of 560 and 288 points in X and Y respectively.

Networks explained

A TEACHING package* on networks, designed for self instruction or for a classroom course, has been produced by the National Computing Centre.

The package comprises a complete set of lecture notes and visual aids. The lecture notes include indications of the expected responses from stu-

dents, and advise the teacher when to show visual aids; use the blackboard and issue exercises.

*Networks Explained, by Fred Offer, 482 pp. £15. Available from technical bookshops or from J. M. Dent and Sons (Distribution) Ltd, Dunthorpe Lane, Leitchworth, Herts (postage £1).



The traffic control system covering Merseyside is due to move into its second phase next month when road junctions outside Liverpool begin to be brought online.

Based on a Plessey XLS control processor with Digital Equipment PDP 11/20s as frontends and four PDP 11/05 as satellites, the system at present controls over 280 sets of traffic lights in Liverpool. At busy junctions and bottlenecks there is TV camera surveillance which enables the operators in the central control room (pictured above) to adjust the system to cope with traffic peaks and holdups.

The second phase will extend traffic light control to Birkenhead, the Wirral, Bootle, St Helens, Southport and Moseley.

To improve the system Merseyside County Council is using a Computer Automation Alpha

LSI-2 in an experiment in dynamic traffic control. The mini is located in a caravan near road systems where congestion is likely to occur. Traffic flow through up to seven junctions is supervised, and the lights are adjusted to prevailing conditions. This provides a flexibility not yet possible on the mainframe.

A second Alpha mini is being used to provide an emergency "freeway" system. Should it be necessary to move a vehicle, such as an ambulance or fire engine, quickly through a section of the city, the Alpha will work out the best route and the control room staff will be able to feed this information into the main system to override the normal control during the emergency. The third Alpha is being used for program development and the establishment of a database.

Wang names Dublin firm as distributor

FOUNDED two years ago to provide support for the Singer Business Machines base in the Irish Republic, Control Systems Ltd of Dublin has now been appointed Irish distributor for

the Wang line of small systems. Spearheading the market attack is the Wang 2200 desktop display computer, which has already scored sales of over 6,000 in the rest of the EEC.

Programmed in extended Basic, the 2200 is offered with over 30 different peripheral attachments, and is being aimed at both the laboratory and small business markets in Ireland.

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Demand for space is so heavy that we have persuaded the GLC to let us use extra space at the Wembley Centre, and that gives us 40 stands in addition to the original 180. That takes care of the waiting list and gives us a few — a very few — spare stands on offer. Telephone Chris Timmins at 01-261 8437 to reserve one of them.

COMPEC '77 — seventh year of the specialist computer, terminals, microprocessors, systems and hardware exhibition.

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by

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NAME
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THE fact that my car registration details are held on a computer in Swansea causes me little concern. The fact that these details have been copied to the National Police Computer at Hendon I find extremely disquieting.

"Half-way to 1984" was the title of a recent BBC "Horizon" programme concerned with computer based information systems, and this perhaps sums up the anxiety of many towards the privacy problem. Thus, the concern is not with illegal access as such, but with the potential misuse of centralised personal information by the State. And the wholesale gathering of information by the police confirms the fear that we are moving towards what has been called "a policeman's dream, but a citizen's nightmare."

How then do we devise privacy systems which resist intrusion from the criminal and the State? I believe that it will need a prior reassessment — both of our methods of identifying people and of our techniques for organising personal information.

First let us look at the problems of data privacy. A systems designer concerned with computer privacy faces two problems.

● How to ensure that personal information is accessible only to those who should have access to it.

● How to organise individual files of personal information so that cross-linkage and the production of life history dossiers will not be possible at a future date.

One way to keep something private is to build a stout wall around it, and solutions based on this idea are widely employed. Restricted access to media libraries, system privilege controls, the use of passwords — all are intended to isolate people from certain areas of the system.

But will such techniques give us data privacy? Probably not. Our stout wall may keep out potential intruders, but it will be less successful against those within the wall — operators, systems designers, installation managers, etc. More significantly, the stout wall offers no protection against a "progressive" corrupt or dictatorial government. Without warning a law could be changed, protective walls removed, and every one's personal privacy immediately destroyed. Reliance on such techniques is therefore foolhardy.

An alternative approach involves disguising information, for example by scrambling or encryption. Unfortunately this is no better. Scrambling codes and encryption algorithms can be broken. Furthermore, a government body wanting access to an encrypted file would doubtless possess a decoder, so again privacy would be destroyed.

Clearly, data privacy is profoundly difficult to achieve. To solve the second problem, the avoidance of potential "cross-linkage", we must first consider the nature of personal identification.

The name that we receive at birth serves moderately well as a personal identifier. Unfortunately, for some purposes this name has a weakness, it is usually not unique.

A common solution is the unique identification number. Thus, a previous employer identified me as "57122WEL". The six numeric digits served as my unique identifier, with the first three characters of my surname used as check digits.

Data privacy for Everyman

How to avoid the second half of the trip to 1984

By WELFO 402200 JA9CK

With the increasing amount of data being held by government databases, John Welford (above, right) believes that the time is now ripe for a change in this policy. He points to the "universal alias" available from the Swansea licensing centre and copied on to the National Police Computer.

The advantages of this scheme are obvious: it avoids confusing one person with another, and ensures that an individual's records (personnel, payroll, etc) are correctly associated with him.

Each such unique identifier is effectively an "alias," and we now normally possess several of these. For example, the Open University has given me the alias "HDC 7125," while the Post Office appears to use a concatenation of my telephone number and the first three consonants of my surname.

To return to the problem of potential cross-linkage. Suppose that we set out to create life history dossiers using records from independent files, we would quickly discover that efficient linkage was possible only if we could find out how a person was identified in each file; ie, if we could discover his aliases.

This has enormous significance for data privacy. Firstly, the more aliases we have the more difficult it will be to cross-link. Secondly, and conversely, replacing our present multi-alias scheme by one employing a single "universal" alias would be fatal for privacy.

Despite our understandable aversion to universal aliases it seems that they are already in use in this country. Observe the alias in Fig 1: this was created by the Department of the Environment, and it appears as the "driver number" on my current driving licence.

This alias is unlike those already noted — they merely distinguished me from other members of some subgroup of the population, eg, those working for a particular employer. The "driver number" alias, however, can distinguish me from everyone else in the UK: it can therefore be used as my universal alias.

Consider the structure of this alias: The first field contains the first five characters of my surname, in disguised form, my date of birth and sex, the first and last digits indicating year ('40), and the middle digits

WELFO 402200 JA9CK

Fig 1: A universal alias.

In the interests of personal privacy he asks that this dangerous precedent be reversed; and is convinced that privacy systems must be designed on a basis of "minimal trust" if the journey along the road to 1984 is to be halted.

Welford — alias WELFO 402200

JA9CK — is a postgraduate research student at the Open University and is an SSRC Research Fellow. Based in Musselburgh, near Edinburgh he is currently researching nominal record linkage for his PhD. This will involve setting up a population database run under IDMS on an ICL 2980.



fortunately, since their contents are often highly sensitive, privacy infringement could be damaging for the individual. However, by disaggregating each file and skimming off crucial identifying information, we could simultaneously achieve our two objectives — acceptable privacy and optimum use of medical data.

Since aliases play a crucial role in the scheme we must think carefully about their construction. Consider the alias for the customer's financial file. Since this alias appears in the financial file it should obviously not contain information which would identify the customer. Ideally it should take a random, allocated value. The "alias number" alias is, at the other extreme, an alias which contains information which can be decoded and used for precise identification. It would clearly therefore be unsuitable.

We must finally consider how practicable it would be to maintain personal information in a disaggregated state and whether appropriate hardware exists.

This approach obviously requires a dispersal of "intelligence" away from the central computer. Happily, developments in distributed processing are making available what is needed. Thus, a central mainframe connected to intelligent terminals provides a hardware organisation admirably suited to the proposed scheme.

The terminals could supervise the handling of aliases and provide convenient operation. However, their storage capacity gives an additional advantage: we can now take our disaggregated personal files and disperse them geographically, identifying information being stored at the terminals, with the remainder held at the mainframe. By extending the principle of disaggregation we could therefore gain even greater privacy.

To return, finally, to the concern expressed at the start towards the transformation of personal information to a "minimal trust" principle, assuming that people are not to be trusted, rather than the reverse, if we can apply the principle consistently and roughly, then who is to be trusted? The journey towards 1984

I am convinced that we can design our privacy systems on a "minimal trust" principle, assuming that people are not to be trusted, rather than the reverse. If we can apply the principle consistently and roughly, then who is to be trusted? The journey towards 1984

Design system speeds Glasgow rebuilding plan

THE computer aided architectural and landscape design system developed at Edinburgh University (CW, November 27, 1974) has found practical use at the government-funded Scottish Special Housing Association, one of Scotland's biggest housing building organisations and landlords.

One of its early jobs will be helping to redesign the east end of Glasgow, which is

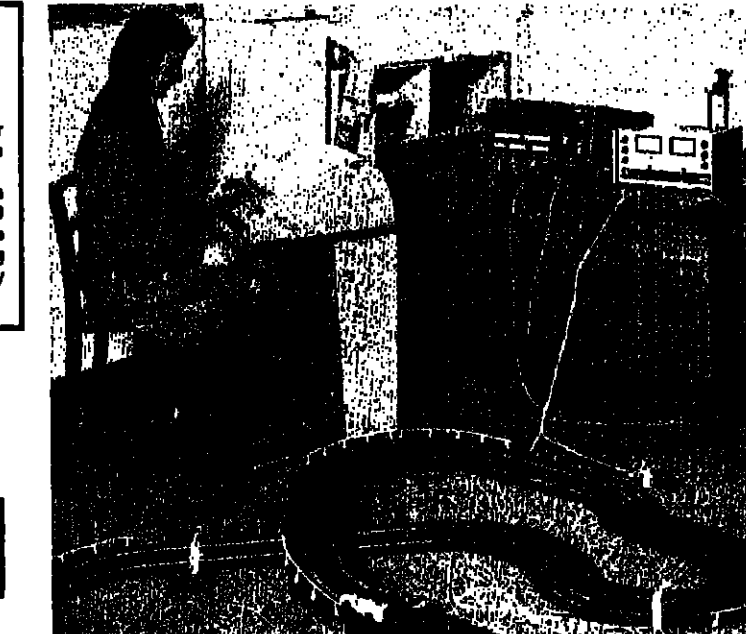
being rebuilt in a £120 million slum clearance project.

The Scottish Special Housing Association now has its own Digital Equipment DECsystem-10 for running the system and expects it to be used as a matter of routine in all its projects by the end of the year.

Hunter Cairns, assistant principal architect at the association, said it normally took up to

sight weeks to design a house and another month to work out costs. Using the system the entire process was completed in a week.

The system has already been used to design 60 houses in Bo'ness, West Lothian, and 100 houses and flats in Clydebank. The clearance of Glasgow's slums will involve designing factories and workshops, a riverside walkway and accommodation for 60,000 people.



Schoolboys of all ages would have been fascinated by this demonstration of microprocessor-controlled Scalectric motor racing, one of the star attractions of an open day and charity fair held by the W. S. Atkins Group at its Epsom offices.

Atkins' Systems Engineering Department set up the demonstration and used an Intel 8080 based Intelc 8 microcomputer linked to 14 sensors on the 30 foot track to control one of the two cars. Its competitor remained in the hands of a human driver with a hand-held throttle.

Atkins explained that the sensors were distributed around the circuit to pinpoint accurately critical areas, such as bends and inclines, and that systems testing enabled estimates of speeds to be refined and optimised so that the car would run at nearly the maximum speed possible consistent with staying on the track — popularity known as dicing with death.

But Atkins sees its hardware/software package being used for more than fun and games. The company points out that the same software can handle any similar type of application such as a conveyor belt controlling the flow of materials on a production line.

Mini helps to detect cancer

COMPUTER analysis of infra-red scanner data by a Honeywell Level 6 mini is helping to detect breast cancer.

A two-year study in the US sponsored by the National Cancer Institute, is being carried out by researchers at the University of Oklahoma Health Sciences Centre. Potential radiation hazards are eliminated by the use of infra-red techniques, enabling a thermal "picture" to be built up.

The thermal charting is recorded on magnetic tape in the form of temperature readings of 1/100 sq inch skin areas.

By analysing these temperature differences, diagnosis of a number of conditions can be made, including cancer.

The scanner technique has been developed from earlier Honeywell programs for aerial infra-red monitoring for crop disease or geographical feature checking.

MPs take to task government board

THE criteria employed by government bodies to assess the technical and economic feasibility of new technological developments has been called into question by the Commons Select Committee on Science and Technology.

The doubts have been expressed in a report from the Committee, which is the result of a study of one particular development in the high precision machine tool industry.

In this instance, the government body was the Mechanical Engineering and Machine Tools Requirements Board of the Department of Industry, which has responsibility for approving government finance for machine tool projects.

The project in question was a gear grinding machine that employed a computer-controlled gearbox system to produce an operating accuracy 10 times greater than previously available. The machine had been

designed by Matrix Machine Tools and the Cranfield Unit for Precision Engineering, part of the Cranfield Institute of Technology, and had as additional interested parties, Westland Helicopters and Rolls Royce.

Key to the committee's criticisms of the Requirements Board rests with the latter's desire for short-to-medium term results, especially in sales and financial returns. In addition, the requirement for a minimum 50% financial commitment by the industrial company concerned "failed to reflect a proper

understanding of the current financial problems facing the machine tool industry."

The board was also taken to task, as was Matrix, for not seeking more evidence on the equipment's market potential. The original Matrix market survey was based on historical trends in the industry, and not on the potential market for an entirely new machine.

Second Report from the Select Committee on Science and Technology. A case study of a machine tool development at the Cranfield Institute of Technology (HMSO £3.60).

In aid of disabled and blind computer staff

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Computer Weekly is holding its second Charity Ball. Last year we celebrated our tenth anniversary, this year we are just celebrating. Come and join in the big night out for the computer industry and help us raise funds for the MATE project. Proceeds from the Ball are to be donated to the British Computer Society Specialist Group for the

disabled to aid the development of MATE II, a memory-assisted keyboard terminal designed for use by disabled and blind people. The Ball is being held under the patronage of the BCS and we invite all our readers to support this very worthwhile cause and at the same time enjoy a pleasant evening with friends and colleagues.

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Tables for parties of 10 can be reserved on request

Friday October 14 at the Royal Lancaster

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Handwritten signature and stamp: Tony Higgins, 1.12.77

Survey of IBM users

A SURVEY of IBM users is being made by the users' association to pinpoint possible areas of improvement in support. The survey is the second carried out by the association in three years.

"Members have different views about whether there have been any improvements since the last survey," said an asso-

ciation spokesman. "The survey will give a more precise picture of any changes."

The 660 members will receive a questionnaire covering such matters as engineer response times and hardware reliability.

The results, expected in January, will be discussed with IBM.

Xerox Corp to acquire Shugart

LEADING independent manufacturer of floppy disc drives, Shugart Associates, is being acquired by the Xerox Corp. Shugart says that a letter of intent just signed with Xerox should lead to a final agreement before the end of the year. Under this Shugart will operate as an

autonomous subsidiary of Xerox with its existing management and international distributor network.

Shugart, founded in 1973, is based at San Jose, California and had a turnover of \$18 million in its financial year ended April 30.

Motorway meeting

FOLLOWING the British Computer Society's offer to evaluate the computer controlled motorway signalling system, Dick Waller, chairman of the BCS Privacy and Public Welfare committee, has had an initial meeting with the Traffic Control

Department of the Department of the Environment.

A controversy started after a fatal accident on the M4, but a police inquiry had since indicated that the accident happened before any computer or operator action had become necessary.

US firm gets big PO order

● From front page

given the opportunity to make a second bid before the award went to the US company.

The company believes that the Department of Industry would be the appropriate body to investigate the order. The department says it has received a letter from Case but has not yet decided what action to take, if any.

The Case 670 multiplexer is used by the French PTT both for a service similar to Dataplex and in the planned Transpac packet-switched network. Case is also on the brink of winning the £55,000 multiplexer contract for the EEC's planned Euronet packet-switched network.

Case's new generation of multiplexers, due out in about a year, was heavily supported with money from the Department of Industry, with the Post Office acting as technical con-

sultants.

"There could be no better way of demonstrating the confused state of public policy on the UK computer and communications industries," said Peter Burton, Case's other managing director.

"On the one hand, the government is helping Case consolidate its position as the only European manufacturer and UK market leader in multiplexers, while on the other hand, a large public corporation wants to give support and encouragement to a hitherto almost unknown foreign competitor. You can't get much more crazy than that!"

Infotron's European distributor is to be Infotron Systems of Dorchester, Dorset in which the US company has a large minority stake. The company said that the Time Line 780 devices, which are to be supplied under the contract, will be 60% manufactured in the UK.

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Contact: Mike Creamer

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Contact: Margaret Stevens

Marketing Support Specialist

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Contact: Mike Creamer

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GCOS experience. 1 year to 18 months for North London installation. Three shift system — H6000 machine.

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To operate a twin B4700 on a 12 hour shift system. Equivalent experience accepted on medium sized machines.

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For ICL 1900 installation — two shift system, nine months + experience for W.1. company. LVs + O/T.

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Two years ICL 1900 GII or GII+ and MACRO writing experience for W4 company. Days only + Bonus.

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Three shift system — 120 years + experience DOS. Machine runs under QSM VT HASP. Three weeks holidays — W.1.

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If you are interested in this vacancy, please write for an application form (quoting job reference number) to: Mr. B. Sutherland, Personnel/Training Officer.

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Contact: Mike Creamer

Technical Authors & Engineers

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COBOL/PLAN Programmers

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A large international manufacturing company are seeking COBOL and/or PLAN programmers with at least 1 year's experience in industry. Recognised large main frame experience is ideal; applicants interested in rapid promotional prospects preferable. *Attractive company benefits and generous relocation package offered.*

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Herts.

Neg. c. £6000

Our client, a progressive and expanding mini computer manufacturer, requires an instructor to provide training courses in the application of computers to business systems. The successful individual will have considerable experience of business orientated applications including the development of accountancy systems. Additional knowledge in the stock/production control areas would be an advantage. Previous instructing experience is obviously desirable but candidates with the potential, enthusiasm and flexibility of approach to training will be considered. *Excellent opportunity for career advancement.*

Contact: Margaret Stevens

FORTTRAN/RXS11
Programmer

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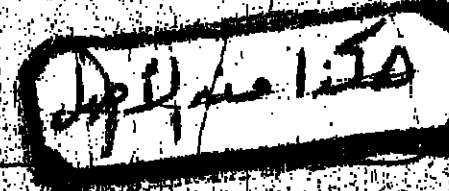
Our client, an international organisation, has a vacancy for a software specialist to work on new systems in the commercial area. Applicants must have several years experience in d.p. and be competent in FORTRAN using RSX11. A commercial or communications background would be preferred. This is an exciting opportunity to join a large well-known company. *Salaries negotiable. Excellent fringe benefits.*

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For further information on any of the above vacancies please contact the appropriate consultant. If your qualifications do not match the above positions but you are seeking other opportunities please contact us anyway.

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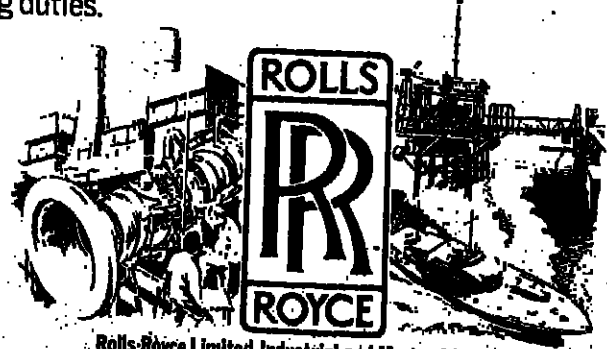
Programmer

with at least 1 year's COBOL experience. The main task is the design, coding, testing and documentation of programs. Successful applicants will be expected to make a full contribution to the work of their team.

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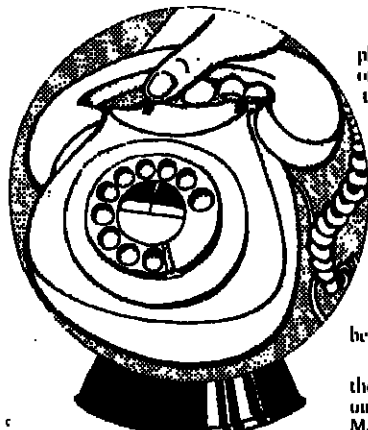
Write or phone for an application form to Mrs. K. Brown, Personnel Department, Rolls-Royce Limited, Industrial and Marine Division, P.O. Box 72, Ansty, Coventry CV7 9JR. Tel: Coventry (STD 0203) 613211.



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Positions carry salaries of up to £5,000 per annum, according to experience. Candidates should have a minimum of two years' experience.

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ET DEI IPSI EIS QUI OCCASIONI DESINT AUXILIUM FERRE NON POSSUNT

We are the newly formed information processing subsidiary of a large multi-national group. One of our objectives is to become the leading European supplier of microprocessor based small business systems. We have immediate vacancies for several top specialists, men or women who, by their contribution, will justify substantial rewards both materially and in job satisfaction.

We expect candidates to be of degree standard though they may not have a certificate to prove it. Analytical ability, tenacity, initiative and a capacity for attention to detail are essential; a strong sense of humour will help when the going gets tough. Those accustomed to inventing excuses for failure to meet deadlines will find the work unenjoyable; those who deliver the goods will progress rapidly as the organisation develops. Basic salaries of up to £8000 plus car and the usual fringe benefits are offered. Additional payments will be made based on the profitability of individual projects. Location is London; some European travel may be necessary. This is an opportunity to get in at the start of an exciting new venture — if you enjoy a challenge (or if you would like a translation) drop me a line.

TED DAVISON
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CITY OFFICE
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LONDON, EC1Y 4UD

MICROPROCESSOR ENGINEERS

Prime tasks: To establish a department which will:

- 1) Test, install and commission microprocessor based commercial systems
- 2) Develop new hardware to improve performance of these systems

Attributes: Essential

Detailed knowledge of LSI/11 based hardware systems — especially with cartridge and floppy discs

Organising ability and management skills

Preferred

Experience of networking LSI/11s and PDP 11s both locally and via Data Communications

Knowledge of PDP 11 Assembler and operating systems — especially RSTS and RT11

Remarks: A training visit to the USA will be an early requirement

SOFTWARE PROJECT LEADERS

Prime tasks:

To carry out major software projects for turnkey systems using LSI/11 microprocessors

Attributes: Essential

At least three years' experience of commercial software applications (preferably with DEC hardware). A proven record of meeting agreed deadlines.

Preferred

Experience of PDP 11 Assembler, RSTS and RT11 operating systems and real time programming

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WDP is a well established Bureau and Software House currently expanding its services to cover the ICL System 10 range of computers.

We require an experienced Programmer or Analyst/Programmer to fill an important and responsible role on System 10 Software Contracts.

Applicants must be able to show their competence in ASSEMBLER and have a good working knowledge of the basic software. Experience in program design/specification and/or applications software would be an advantage.

The successful applicant will be offered a salary according to experience; assistance with removal expenses will be given.

Please contact:
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7/8 Colston Crescent
Exeter, Devon EX2 4DG
Tel: Exeter (0392) 34131

UNIVERSITY OF CAMBRIDGE

COMPUTING SERVICE

The University Computing Service has vacancies for two computer Officers

SYSTEMS PROGRAMMER

to be involved with the maintenance and development of operating systems

for the University's IBM 370/185 computer and associated communications and other equipment.

USER SERVICES PROGRAMMER

to be involved with all aspects of liaison with a large user population both in Cambridge and from many other Universities.

Applicants should have a degree or equivalent qualification, experience of computer use in a university environment would be an advantage.

Appointments will be to a university environment would be an advantage.

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Super CAMBRIDGESHIRE Salaries to Benefits SYSTEMS ENGINEERS £5,500 p.a. (1900 PLAN & 370 ASSEMBLER backgrounds)

Our Client is a small, professional concern which is a market leader in its specific area of packed system sales, development and installation. It is soon to extend this pre-eminence into a fresh and exciting associated application area, and these positions are open at the start of this new venture.

Specifically you should have:

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- * the ability to work closely with clients and to act as professional, technical ambassador of the company
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REF. 77/08/6

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MANAGEMENT & EXECUTIVE SELECTION

telephone 01-637 9611

PROGS, ANALS

ESSEX

to £5K

All levels of staff from trainee to senior analyst are required by our client, a multi-national company. They are currently installing an IBM System 3 and are designing and implementing production and financial systems. Initially the processing will be in batch mode; on-line systems are planned in the near future. RPG II experience is essential. Full training will be given to novice programmers and to those wishing to become analysts. Benefits include full relocation expenses, a yearly bonus scheme and the opportunity of joining a company where promotional prospects are both varied and excellent.

Contact Pam Quinlan.

SUPPORT MNGR c£6K LONDON

A well established international computer manufacturer requires a capable executive to manage all technical support for pre-sales activities and the implementation of customer systems using standard products. He/she must have a thorough knowledge of disc-based DP systems; experience of the complete implementation of computer systems through Sales Project or MIS involvement; one year's programming in a high-level language (pref. COBOL); and previous supervisory or management experience. Sales Support/DP Management/or Snr Systems Analysis backgrounds will be most appropriate.

Contact Peter Gorton.

Suite 201/6 Albany House 324 Regent Street London W1R 5AA 01-637 9611

SUPPORT ANAL c£6K CENTRAL LONDON

A responsible and self-motivated person is required by our client to co-ordinate the systems and programming support required by their users. Liaison with both manufacturer and software house will be necessary to ensure this. You will also be responsible for the analysis of new system requirements, thus the ability to establish a close working relationship with users is a must. Commercial experience gained on mini computers is essential; a knowledge of O & M or accounting would be helpful. Priority will be given to those candidates with real time systems experience gained on DEC equipment.

Contact Pam Quinlan.

SALES Total Earnings £12K LONDON BASED

A major computer manufacturer is in the process of setting up a new division which will deal exclusively with the large manufacturing corporations. They require a mature sales person, with experience in this industry, who is capable of negotiating large contracts, at board level, and who also has the initiative to develop this new business venture. This position offers an ideal opportunity to be a member of a small team and to be in the right place when the future management structure is developed.

Contact Faye Ogilvie.

MANAGEMENT & EXECUTIVE SELECTION

Duncan Bransom Recruitment SENIOR SYSTEMS CONSULTANT - £8.500

The Company

The Company is HERTZ, the world leaders in the car rental business. Their European Headquarters is at Isleworth, Middlesex, which is also the base for their Management Systems and Services Department. Operating in the dynamic car rental business, the company requires information systems that can respond quickly to new situations.

The Job

The job involves designing and writing innovative computer systems to operate on an I.B.M. mainframe using non-I.B.M. minis for front end processing.

In the dynamic car rental business the market place is constantly changing and with it the requirements for management information. Thus basic systems of an accounting nature have to be developed as well as the information systems that use them as a source of data.

Such systems need to be applicable to all countries in Europe, thus some travelling to the continent can be expected amounting to about two or three days per month.

You

You have had at least five years' experience in designing and installing systems — most of it in an I.B.M. mainframe environment where the installation language was Cobol, probably under OS.

Already you have proved your ability in managing staff either as a project leader, systems manager or data processing manager.

Now you are looking for a job where the pace is a hot one, where decisions are made quickly instead of through interminable committee meetings, and where you can be involved not only at the feasibility stage but right through to start-up and implementation.

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Telephone 01-508 5121

Duncan Bransom Limited



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Leasco

Due to winning a number of prestigious contracts both in the UK and Europe, we are now looking for professionals of the computing world with skills in the following areas:

DEC PEOPLE	Both at home and abroad we need staff with RSTS and BASIC PLUS experience.
EUROPE & IN-HOUSE	Data General Programmers and Analysts with one to five years' experience. Knowledge of BASIC or COBOL or Assembler.
IBM TEAMS	To supplement our IBM teams we need staff who have worked on System 3 machines; or used IMS or RTAM packages; or have experience of operating IBM Operating Systems.
CORAL EXPERTISE	Programmers with a minimum of two years' experience. MEDICAL FIELD or ARGUS 700 knowledge an asset.
TECHNICAL AUTHOR	We are looking for an adaptable technical author to work on a wide variety of projects who has the ability to write both user and operating manuals.

If you meet these demands and you want to expand your career apply to Dawn Jeans, Personnel Officer, Leasco Software Limited, 150 Bath Road, Maidenhead. Telephone Maidenhead 23391.

Facilities and benefits offered include free recreational activities, car parking, lunches, modern offices, sickness and life benefits, part-contributory pension scheme. Generous allowance while working overseas.

Salaries negotiable in the range £3,500 - £9,000.

IBM System/3

London West Central

SENIOR ANALYST/ PROGRAMMER to £6,250 p.a. RPG II PROGRAMMER to £3800

THE COMPANY: A well-established and profitable international organisation, who offer secure employment. RESPONSIBILITIES AND REQUIRED BACKGROUND

The Senior Analyst/Programmer will handle all aspects of the development and implementation of systems, including programming. Some supervision of staff will also be involved.

Suitable candidates are likely to have at least 5 years' DP experience, some gained within an IBM environment. Competence in RPG or COBOL is also required.

Above all, applicants should be articulate, self-starting and have a professional approach to their work.

The Programmer will undertake programming work but will also become involved in applications systems.

Previous experience of programming is required, ideally on IBM EQUIPMENT.

Also required is the ability to understand and maintain complex systems. Age possibly early 20's.

PLEASE TELEPHONE WITHOUT DELAY or if you prefer, send a personal summary.



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recruitment division
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24-hour answering service



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COMPUTER WEEKLY

We are looking for writers to join the successful and experienced team on Computer Weekly.

Essential qualities are proven computer experience or a qualification in computer-related studies, plus the ability to write quickly, accurately and clearly to meet strict deadlines.

People with operations experience and/or an in-depth software background will be given priority for the current vacancies. However, if your experience falls outside these areas, and you are interested in joining the team, why not contact us?

Writing for Computer Weekly is a job that opens up interesting new career possibilities for DP people. If you think you can meet our standards contact Malcolm Peltu, Editor, Computer Weekly, Dorset House, Stamford Street, London SE1 9LU, giving brief biographical details.

Sales Demonstrator

We are looking for someone to demonstrate Sperry Univac data processing and terminal equipment in the South of England. You would be prepared to travel away from home frequently and a clear driving licence is essential. You'll have a lot of fun getting on with people as well as the ability to train customers operators.

We offer a generous salary, plus car allowance and the normal large company benefits.

Write or telephone (you may reverse the charges) Nigel Harris at Sperry Univac, 85 Holborn Viaduct, London EC1P 1AB.
Telephone 01-235 1010 and arrange for an interview.

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FORTRAN
Programmers urgently required for industrial and scientific development.
£3,500-£5,000
ALL AREAS
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**Greater Glasgow Health Board
SYSTEMS DESIGNER**
Salary Scale: £4000-£4800 + £320 flat rate supplement.
Applications are invited for the above post within the Board's Computer Applications Unit. Candidates should have a good knowledge of systems design and the ability to supervise staff working in FORTRAN/PLAN.
Application form and further details may be obtained from the Personnel Officer, Greater Glasgow Health Board, 381 Buchanan Street, Glasgow G2 3HT, to whom completed forms should be returned by Wednesday, 31 August.

IMPERIAL COLLEGE

POSTDOCTORAL RESEARCH ASSISTANT

required with experience in COMPUTER PROGRAMMING, to work with Dr. H. R. Morris on an SRC Research Grant (1 year). The research will involve the development of new programmes to aid the automatic structure elucidation of biological molecules using a new COMPUTER/MASS SPECTROMETER installation.
Salary up to £4254 incl. London Allowance, + USB.
Applications including curriculum vitae and the names of two referees, should be sent to Dr. H. R. Morris, Biochemistry Dept., Imperial College, London, SW7, as soon as possible.

THREE PROGRAMMERS CENTRAL LONDON c £5,000

We have been retained by our client, a ten year old service bureau to recruit Our client, who is presently embarking on a new software house venture which heavily involves the use of MINI computers, requires candidates with a thorough working knowledge of COBOL together with a good understanding of an Assembler language.

It is envisaged that candidates have a minimum of two years' programming experience and the ability for creative thinking.

Although only a small company (less than thirty people) our client has satisfied a large number of demanding clientele for nearly ten years and therefore the opportunity to grow from within as the company continues its expansion, is excellent.

Our client would also arrange both in-house and manufacturers courses in Assembler or other according to candidates' background.

For more details and to arrange an informal interview please contact STUART WINFIELD on 01-439 9817/8 or (01-439 3933, 24 hours).

RECRUITMENT RESOURCES LIMITED

2 Gt. Marlborough Street
London W1V 1DG
01-439 9817/8



PL/1 PROGRAMMER

The makers of G-Plan furniture are seeking a programmer with at least 18 months' PL/1 experience, to join a small team.

The installation is a 370/125 operating under DOS/VS with POWER and we are currently implementing a trial T.P. Order Entry system under SHADOW/II.

The successful applicant will be expected to show considerable initiative and work with minimum supervision.

Conditions of Service and Salaries are very good. Apply, stating details of experience, to:
Company Personnel Manager
E. GOMME LIMITED
P.O. Box 27
High Wycombe, Bucks.

BENEFITS INCLUDE INTERESTING WORK FOR A GOOD COMPANY IN NORTH LONDON

Systems Software Programmer

We would like to hear from Software specialists with experience of a large mainframe or from CHIEF OPERATORS or SHIFT LEADERS with Honeywell 6000 or Level 66 who would like to be trained into the software area of maintenance and support.

Analyst/Programmer

For the development and maintenance of engineering systems on a Honeywell operating time sharing and remote job-entry terminals. Typical applications are logic simulation, test generation and analog circuit analysis involving interfaces with graphic systems. Applicants will need about one year's experience of FORTRAN or another mathematical language.

Telephone Mike Batsch, 01-235 7030, Ext. 216

PER PROFESSIONAL
AND EXECUTIVE
RECRUITMENT

This vacancy is open to male and female applicants

Programmer/Analyst for large mini-computer. Marketing oriented applications.

Three factors pick out this job from the other ads: the machine, the environment and the programs. You will be working on a PDP 11/40 using RSTS, with 198K bytes (Basic Plus language) - so, by mini-computer standards, decidedly not so mini.

The small department of programmer/analysts and terminal operators serve in-house clients who are essentially marketing people and who (enough on its own to make the job attractive) understand the computer and don't need educating in its use.

Most interestingly, though, the applications vary immensely from the usual payrolls and ledgers. The computer is used for marketing analysis, sales forecasting and product costs: there are new applications to be developed, but they too will be marketing oriented. Our candidate specification is wide: we need another team member and we'll pick the person to suit our style - young, practical and lively - whether he or she is basically a programmer, or has systems experience.

For this reason, the salary is variable too - but, whatever you are earning, if you are right for us the combination of job interest, super Knightsbridge offices and good salary will make sure you feel we are right for you.

Please write with full career details to: Jacqui Thomas, Recruitment & Training Officer, Avon Overseas Limited, Bowater House, 68-112 Knightsbridge, London, SW1X 7LR.

AVON



IBM 360/370
ICL 1900, 2900, SYSTEM 4
UNIVAC 1100, 9030
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PROGRAMMERS, SENIOR PROGRAMMERS
ANALYST/PROGRAMMERS, SYSTEMS ANALYSTS



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anytime from

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ALSO HAVE A NUMBER OF MEDIUM
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STARTING SOON, IN THE MIDDLE
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Our successful program of development is continuing to extend and integrate the U.K. broking systems using both database and distributed intelligence techniques.

In addition we are now expanding the system services organisation to provide data processing support for overseas members of the Sedgwick Forbes Group.

This has created a number of opportunities for experienced systems staff in both the development and production departments.

If you enjoy a stimulating and demanding environment come and talk to us.

Applications in the first instance to
Mrs J. Smith, Personnel Officer, Sedgwick Forbes Group, Grove House, Newland Street, Witham, Tel Colchester 69191

Applied 1.5.78

April 11 1878

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....market leader in the field of high temperature insulation and manufacturer of Triton Kaowool Ceramic Fibre is expanding its activities in the Witral area.


The company requires a:-
SENIOR SYSTEMS ANALYST to control new computer hardware and systems shortly to be installed.

Applicants of either sex should have experience of programming plus the design and implementation of on-line systems. It is unlikely that anyone under the age of 28 will have the *required experience.*

A good salary will be paid for the right person, plus relocation expenses to this rural area close to Chester and the North Wales coast.

Apply with C.V. to:-
D.B.A. COMPUTER SERVICES LTD.,
21, MORLEY ST. LONDON SE1.
Telephone: 01-428 4592.

The logo is a rectangular box with a double border. Inside, the word "TRITON" is at the top, "Kaowool" is in the middle, and "Ceramic Fibre" is at the bottom, all in a stylized font.

The logo consists of a stylized, blocky letter "M" followed by the word "Morgan" in a sans-serif font.

[illegible]

datascene

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£9,000 + Profit share**

Primarily, this is a job for a real business go-getter. Someone who can consolidate existing business, increase volume and turnover, and seek out new clients.

In a new position created by the expansion of a computer services company based in the West End of London, you will also be responsible for the recruitment of consultancy staff capable of providing services of the highest calibre.

You should already be successful at providing services to the computer industry, working in a sales-oriented environment, used to working within budgets, and capable of writing proposals. Obviously you must be ambitious.

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Find out more by telephoning Martin Grayson or Mike Dauncey

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Knowledge of ICL PLAN and COBOL is vital. Working with a minimum of supervision, you will be involved with GEORGE 2+. Redifon-Seachack and ICL Data view, so experience in any of these would be an advantage.

Salary: S01 £5,044-£5,350 p.a. Inc.


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Further details and application forms from Personnel Officer, Town Hall, Forest Road, Walthamstow, E.17 (Tel: 01-531 8899 — 24-hour answering service).

Closing date: 8th September, 1977. Please quote Ref: B.509.

London Borough of

Waltham Forest



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Rotating Shift Allowance. Five-day week.

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Our present installation comprises a 1.5 mb 370/146 and a 0.5 mb Honeywell H4201 operating on a 3 x 8 hour shift/5-day week basis. A 2mb 370/148 is due for installation in October/November of this year. We undertake a wide variety of both batch and on-line applications and currently have about 160 remote VDUs installed throughout the Region. IBM software in use includes OS/VS/VM/370, CMS, VTAM/NCP, CICS and ATMS.

- * Good working conditions
- * Generous holidays (this year's arrangements 'honoured')
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- * Sports and social facilities

Write giving full details, within 7 days, and quoting Ref. F3498 to: Personnel Manager, Segas, Seg House, Ketharine Street, Croydon CR9 1JU.

SEGAS

**COUNTY TREASURER'S
DEPARTMENT**
Computer Services Division
**SENIOR SYSTEMS
PROGRAMMER**
Post Ref. T275
Grade 801/2 (£439-£492 plus £820 supplement)

The post leads a team of three systems programmers responsible to the Operations Manager. He/She will have a minimum of five years' experience of the ICL George III Operating System, together with communications equipment and Datadive. A technical background in a large machine environment is essential.

Responsibilities will include operating system support, maintaining communications support plus Datadive experience, together with involvement with the Systems/Programming Development Teams

**Software
Programmers**

Salary £3366-£4095 (plus supplements)
Post Refs. T276/T277, totalling £520

Applications are invited from suitably experienced persons who must have a sound knowledge of the operating system and other standard ICL issued software. The successful applicants will make up a team of specialists, led by a senior software programmer, who are responsible for all system software including communications manager and datadive

Programmers

Salary £1,215-£4,545 (plus supplements of up to £820). Post Refs. T267-T270

These posts are career grade appointments; the starting salary point and although the grade will be based on experience and qualifications and will offer, for the right people, a flexible career development path and the opportunity at a later date to acquire some experience in systems analysis.

FOUR vacancies exist and applications are invited from competent programmers with a minimum of two years' experience of COBOL. Knowledge of ICL software and George 3 operating procedures is desirable and experience of NCC FILETAB would be an advantage.

The County Council, with offices in Barnsley has a 192K ICL 1904S computer running under George 3 operating systems with extensive MOP and communications facilities.

Applications arise from conventional batch systems to those involving integrated database techniques and emphasis, wherever practical in the future, will be on terminal based systems.

The hardware comprises of high speed drum 9K EDS 60, 7803, 7502 with VDU equipment, RJE via 7503/Venkat terminals.

Please telephone or write for application form (quoting the appropriate post reference) to the Chief Executive, South Yorkshire County Council, County Hall, Barnsley YO2 2TN. Tel. Barnsley 98147, Ext. 266.

Closing date will be September 1st, 1977

**South Yorkshire
County Council**

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\$4000 to \$7000

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You'll be working in a stimulating environment where personal matters almost as much as ability

Mind you, ability is important. You'll need at least 18 months' COBOL or PL1 programming experience, with either an IBM or CICS background. Data Base experience would be handy, but it's not essential.

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LEEDS

ANALYST/PROGRAMMER

Up to £4,200

Elida Gibbs Ltd., the Unilever toiletries subsidiary, is currently installing a computer system within a new, fully automated £7m distribution warehouse, which will be controlled by two large DEC PDP 11/70 computers programmed in both CORAL 66 and COBOL.

The system controls two giant order picking machines, a driverless tram used for the transfer of incoming goods (with its own dedicated PDP 11/04), 20 VDU's throughout the warehouses (including 4 MIMIC colour displays) and a certain amount of batch processing.


The Analyst Programmer will work in the team which is developing and implementing this system, followed by goods receiving, materials control and factory data capture applications based on a number of PDP 11 mini computers running as part of a network.

On behalf of our clients, we are looking for an ambitious programmer with:

- upwards of 1½ years' practical experience ON ANY MACHINE in a commercial environment
- a good educational background and a high degree of self-motivation
- the aptitude to develop into systems analysis in due course.

Assistance with relocation expenses will be provided where applicable. Initial interviews will be held in Leeds or London, whichever is the more convenient for you.

If this excellent career opening appeals to you, please ring us, quoting ref. 318. Alternatively write briefly or leave a message with our answering service after hours.



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EDP Systems

52-53 Margaret Street
London W1N 7FF

CITY up to £6,500

COBOL PROGRAMMERS/ANALYSTS

Computer Express is an established consultancy providing professional service to a variety of clients. We are looking for programmers and analysts with at least two years' experience. We offer a challenging environment with good future prospects.

Telephone or write to The Technical Director
Computer Express (Services) Ltd., 69 Carter Lane
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NORTH WEST

Our client is a major international company with headquarters in the North West of England.

Due to extensive reorganisation of the systems department the following opportunities have occurred in Project Management to further develop manufacturing and engineering Systems.

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To investigate problems in the manufacturing and engineering areas and define and communicate precise 'user' needs for specific projects to technical colleagues. Also to implement and explain new and revised Systems to ensure user satisfaction.

Project Leader

To plan and control the development of computer based solutions to manufacturing problems and control Systems through from design to testing and implementation. Liaison with user departments is also involved, including demonstrations of Systems capabilities.

The company has a well established computer installation and is committed to further development of existing Systems making use of up to date techniques, mini computers, data base, telecommunications and distributed processing.

Successful candidates with proven experience in the above areas will receive a good salary; generous holiday entitlement, relocation assistance (if applicable) contributory pension scheme and participation in the company's car scheme.

Please write in confidence giving details of your experience and qualifications stating the names of any organisations to whom your letter may not be sent, to: R. D. Taylor.

Whites

Whites Recruitment Limited, 35 Dale Street, Manchester M1 2HF
Offices: Associates: Amsterdam, Bristol, Brussels,
Dusseldorf, Leeds, London and Wolverhampton

A Career in Computers in the North West & Midlands

PROGRAMMERS & ANALYST PROGRAMMERS to £5500 + expenses

SENIOR PROGRAMMER/ANALYST

SENIOR ANALYST

CONSULTANT

S & P PROJECT MANAGER

ANALYST

SENIOR PROGRAMMER

ANALYST/PROGRAMMER

LEADING PROGRAMMER

TRAINEE ANALYST/PROGRAMMER

GENERAL MANAGEMENT

The Fraser Williams Group represents an exceptional opportunity to join and progress in the software industry

We are a well established company with an impressive record of growth. Our turnover has increased by 50% in the last year, and it is planned to continue expanding at this rate. We therefore need good quality people to help with this expansion. It is group policy to promote from within the company wherever possible and excellent opportunities exist for promotion to senior positions. The work is varied, assignments cover a wide range of main frame and mini-computer equipment both in the U.K., and overseas. As well as an attractive salary we operate a profit sharing scheme which is paid half yearly and is based on an individuals own ability. We offer mileage expenses which make a significant contribution to the cost of running a private car.

If you are people who are the kind of person we require contact your nearest Fraser Williams office now!

Manchester

J.E. Kinder, Fraser Williams, (Manchester) Ltd.,
Warwickgate House, Warwick Road, Manchester M16 0QQ.
Tel: 061-872 8428.

Liverpool

J. Elliott, Fraser Williams & Co. Ltd.,
61-63 Dale Street, Liverpool L2 2HJ. Tel: 051-227 3371.

Birmingham

A. Dowman, Fraser Williams (Midlands) Ltd.
10/11 Greenfield Crescent, Edgbaston, Birmingham B15 3AU.
Tel: 021-455 8736

Offices also in London Tel: 01-388 0036
and Sheffield Tel: 0742 28638

Fraser Williams
computer consultants

SOFTWARE DEVELOPMENT

SDI is expanding its software development capability and new employment opportunities are consequently available. It is the leading supplier of packaged Systems Software, being responsible for such packages as GRASP, GRASPS, EPAT and FLEET, and operates in many countries having more than 200 employees.

You will be located initially in London and after successful completion of a three month probation period will be transferred to SDI's Research and Development centre in Hamilton, Bermuda. Bermudian applicants are especially welcome.

SDI owns and operates a large IBM 370/135 computer in Hamilton. There are VDUs and a TP link to the U.S.A. The entire computer installation is dedicated to software development, so the facilities and turnaround are of the very best.

Vacancies exist within SDI for Senior Software Developers and Software Developers. This is an opportunity to participate in the development of Systems Software packages with the industry's leading specialist company in this field.

The required qualifications are:-

- * First-rate assembly-language programming ability;
- * Familiarity with IBM DOS or DOS/VS Internals;
- * Willingness to work hard;
- * For Software Developers, a minimum of 2 years recent IBM DOS or DOS/VS experience;
- * For Senior Software Developers a minimum of 5 years recent IBM DOS or DOS/VS experience, and preferably experience of supervising others.

Bermuda is a conservative British Colony in the mid-Atlantic, less than two hours from New York. It has a pleasant climate and stable government. Salaries are paid in US dollars and there is no income tax. SDI will assist in obtaining work permits for successful applicants (who must have a maximum of two dependent children). A relocation allowance will be paid.

Applicants for these positions should submit an example (about 200-300 lines) of their IBM DOS (VS) coding together with a completed application form.

An application form or more information about SDI or about Bermuda may be obtained by telephoning Marion Lustig at SDI London, (01) 731 4313. If you wish to apply for one of these positions you must do so in writing to:

Personnel Manager,
SDI, Reference SDA/SD,
184 New Kings Road, London SW6 4NF.

SDI

OPPORTUNITY FOR SYSTEMS PROGRAMMING!

WEST LONDON £5,000+

A Honeywell user in West London, wish to recruit a good applications programmer to take on and train in systems programming. It would be of interest to someone with 2-3 years' COBOL experience and sound knowledge of GCOS. This is an excellent opportunity for a programmer to make a definite career step forward.

CHIEF PROGRAMMER MIDD.

to £8,500

If you are looking for involvement in on-line programming, development, as chief programmer, a large U.K. manufacturer would be interested in you. The successful applicant would be required to lead a team of 5-6 application programmers, he would have COBOL or RPG II language and project control experience as well. Telecommuting also helps. Excellent career opportunities plus relocation assistance are offered.

COBOL PROGRAMMERS BUCKS./MIDD.

£4,500+

Two COBOL programmers are required with ideally eighteen months plus experience and familiar with IBM OS, to work for an international manufacturing and marketing company. Usual excellent benefits associated with a large company include relocation assistance.

SENIOR ANALYST/PROGRAMMER MIDD.

c £5-£6,000

A leading industrial company in Midlands are offering an excellent salary and conditions of employment to a senior analyst/programmer capable of dealing with the techniques of 'IMS' Database, therefore a strong technical bias helps. Applications are on-line, real-time oriented. COBOL could be ideal but not essential.

SYSTEMS ANALYSTS HERTS.

to £6,000

Development career progression, financial or simply fed up with commuting. These are a few of the reasons why you may want to consider working in a more local environment. At this moment we have at least a dozen requirements throughout Hertfordshire for SYSTEMS ANALYSTS with about 2 YEARS' good commercial or financial experience. Our client has a extremely reputable involving new installations and those already committed to expansion. We feel sure we must have a vacancy to suit your needs.

PROGRAMMERS ESSEX

to £4,500

One of the South East's most progressive IBM installations is currently embarking on a variety of new and interesting development projects. To help achieve their aims, they are seeking to recruit additional career-minded programmers with upwards of 1 year's ASSEMBLER experience. Although ASSEMBLER is a preference, those with a good COBOL background and a desire to learn another programming language should also apply. Benefits are excellent including a generous relocation package where appropriate.

SENIOR SYSTEMS ANALYSTS CITY

to £8,500 + BENEFITS

A leading city installation is currently expanding their data processing department to cope with the development of a wide range of major new systems. These projects cover a variety of commercial, financial and business applications. Candidates should therefore possess expertise in one of these areas together with supervisory qualities and the professional attitudes attributed to a senior appointment. Career progression is first-class and the benefits are all you would expect from a company of this stature.

FORTRAN PROGRAMMERS NORTH LONDON

to £5,500

Outstanding opportunities have arisen for experienced FORTRAN programmers to move into one of the most advanced Honeywell installations in the country. Our clients are particularly interested in those candidates wishing to develop in a Technical Support/Software area. Some knowledge of COBOL would be an added advantage. The company would also accept applicants to be interested in developing teleprocessing/communications systems.

SYSTEMS ANALYST c £5,000 + MORTGAGE

ASSEMBLER PROGRAMMER to £5,000 + MORTGAGE

A major financial company with pleasant offices close to the suburb wish to recruit a Systems Analyst with at least two years' financial or insurance experience to be involved with new systems development. There is a further requirement for a programmer with good assembler experience preferably gained in an OS environment. Start salaries will be competitive plus first class benefits including subsidised mortgage and full relocation expenses.

COBOL PROGRAMMER CROYDON

to £4,900

A household name, convenient to maintain railway station in Croydon, have a large 3rd generation mainframe. They currently require several COBOL programmers with upwards of 18 months' experience gained on any mainframe. Benefits are good and an excellent feature of this company is the friendly working environment.

ANALYSTS SURREY

to £7,000

The high demand encountered in July for Systems Analysts in Surrey, has continued the month. At the time of going to press, we have 18 companies based in Surrey all wishing to recruit Analysts and Senior Systems Analysts. The companies range from financial through retail to manufacturing interests and consequently it does not matter in which area your experience has been - we must have a vacancy that can interest you!

ASSEMBLER or PL/1 PROGRAMMER RURAL SURREY

to £4,500 + mortgage

One of the UK's largest financial organisations require 3 programmers with ASSEMBLER or PL/1 experience, to work on a number of varied applications. The company is situated in a pleasant rural location, close to maintain rail services. Benefits include cheap mortgage, flexitime and a non-cont. pension scheme.

THESE ARE JUST A SMALL SELECTION OF OUR CURRENT VACANCIES, CONTACT US TO DISCUSS, WITHOUT OBLIGATION, ANY OF THE ABOVE...

OR CHECK WITH US TO SEE IF WE HAVE MORE SUITABLE VACANCIES IN THE LOCALITY YOU WISH TO WORK.

D.P. RECRUITMENT LIMITED

Kent House, 87 Regent Street, London W1R 7HF
Tel: 01-437 2062/3/4 (24-HOUR ANSAPHONE)

Computing Services Association

PROJECT MANAGER— PRODUCT SALES TRAINING

To £7,500 per annum

Exciting Career Opportunity to join a Major Computer Manufacturer as MANAGER of Product Sales Training Projects. This is a SENIOR POSITION reporting to the Worldwide Sales Training Manager.

You should have the ability to: learn quickly/communicate ideas and concepts/translate product facilities into sales benefits/enthusiasm. Some training experience is preferable, but not essential, and it would be an advantage if you had successful sales experience.

You will be working, in a STATE-OF-THE-ART environment, with Market Development and Product Development Managers on latest computer techniques. This position will give you a CAREERS PATH into Marketing, Sales, Technical Support or promotion within Worldwide Education/Training Group. In the course of your duties you will be required to TRAVEL in the U.K. and OVERSEAS.

The Company offer an EXCELLENT SALARY, EXPENSES, LARGE COMPANY BENEFITS and PROMOTION OPPORTUNITIES.

Telephone or write to the Senior Consultant quoting Reference No. CW 147.

Insight Marketing & Personnel Consultants Ltd.
72-75 Marylebone High Street London W1M 4AJ Telephone: 01-486 5644



PROJECT CONSULTANTS— SYSTEMS

circa £6,000 negotiable

A major manufacturer is embarking upon a sophisticated research programme into the viability of future, co-ordinated, advanced systems for a MAJOR Public organisation.

This is an exciting and stimulating project which will appeal to Business and Systems Analysts with a creative approach to the medium and long term needs of major organisations.

Candidates must have at least five years' experience which should include large mainframe systems supporting on-line terminals. Although not essential, data base experience would be an added advantage.

This is a unique and challenging opportunity which will offer an exciting and progressive career. For confidential, initial discussion, please telephone the advising consultant quoting Ref. No. CW 146.



Insight Marketing & Personnel Consultants Ltd.
72-75 Marylebone High Street
London W1M 4AJ
Telephone: 01-486 5644

MIDLANDS—£12,000 + SALES MANAGERS & SENIOR SALES EXECUTIVES

Do you have a proven record of sales success in the commercial market?
Have you sales experience of computer systems, services or bureau?

Are you seeking the opportunity to grow your career and be one of the highest paid members of the industry?

A generous salary, car allowance and above average commission backed by full technical support, demonstration facilities and established user base will enable you to grow your career on the back of your success.

Ring immediately the advising consultant quoting Ref. No. CW 145.



Insight Marketing & Personnel Consultants Ltd.
72-75 Marylebone High Street
London W1M 4AJ
Telephone: 01-486 5644

Develop with us.

Data 100 Systems Limited is a leading supplier of Multifunction Terminal Systems. Our continued expansion coupled with the introduction of a new range of products has created vacancies for Systems Engineers (Software) and Customer Engineers with the drive and enthusiasm to assist the development of our successfully established Support Organisation.

SYSTEMS ENGINEERS

These positions offer excellent opportunities to move into product specialisation or management positions with the Software Services Group for personnel with experience in some of the following areas:

Applications Programming
Software Development
Communications
Small Business Machines
Interactive Systems
Key-to-Disk Applications

These positions will be based at the Company's Head Office in Hertfordshire.

CUSTOMER ENGINEERS

Suitable applicants will be experienced in the field maintenance of computer and their associated peripheral equipment. These positions offer excellent career prospects leading to management control of customer support areas.

Current vacancies exist in the following locations:

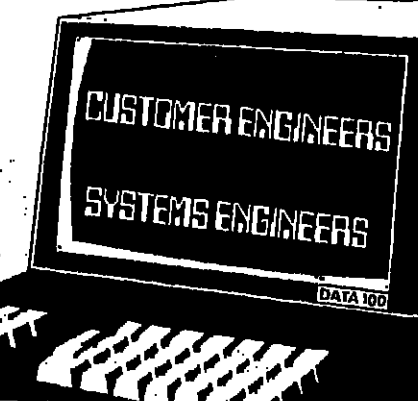
London Central, Manchester, Birmingham, Sheffield

The Company offers competitive salaries which are negotiable and commensurate with experience. A Company car is provided together with fringe benefits, including relocation assistance, where necessary.

If you feel you have the experience that would contribute to our success, please apply to Mr. T. Hubber at the address below.

Personnel Department
DATA 100 Systems Ltd.
Maxted Close,
Hemel Hempstead, Herts.
Telephone Hemel Hempstead 61281

DATA 100



COMPUTER CENTRE

PROGRAMMER

Salary: £2,522-£4,085 (+£312 p.a. supplement)

To contribute to student service work, developments on MAXI-MOP, and the writing of programs for a wide range of scientific and administrative systems for both 2803 and 1803A.

Good working knowledge of FORTRAN, COBOL and experience with GEORGE 2 and/or MAXI-MOP would be advantageous.

Application forms, to be returned by 2nd September, 1977, can be obtained with further particulars from the Personnel Officer.

PLYMOUTH POLYTECHNIC DRAKE CIRCUIS
PLYMOUTH PL4 8AA

Leeds POLYTECHNIC

School of Mathematics and Computing

LECTURER IN COMPUTER STUDIES

Applicants should have a good degree in a relevant discipline and experience in the design of scientific/engineering or commercial data processing systems.

Teaching experience will be an advantage but training on an in-service basis can be given if necessary.

Salary Scale: £3744-£5885 (including supplement).

Re-employment - previous applicants will be considered without further advertisement.

Details from: The Services Officer (C.24)

Leeds Polytechnic, Calverley Street, Leeds LS1 3HE

0532 41101
Please enclose a.s.s.
Closing date: 2 September 1977

The Civil Aviation Authority is responsible for the regulation of civil aviation in the United Kingdom and the provision of Air Traffic Control and associated services for all air traffic into, out of and over U.K. airspace.

The Authority is to expand its Computer Services Branch in London, which is responsible for the development and maintenance of administrative, commercial, technical and scientific computing systems. This expansion includes the replacement, in the latter quarter of 1977, of an ICL 1903T by a 2 megabyte ICL 2960 with EDS 100/200's, CNP, terminals etc.

Systems Analysts to £6,000

A number of Systems Analysts or Systems Designers are required to be responsible to a Senior Systems Analyst or Project Leader for systems analysis, programming and implementation, and for the work of Trainee Systems Analysts and Programmers assigned to them. On larger projects it may be necessary to carry out the functions of a Senior Programmer in writing the main programmes in a system.

Applications are invited from candidates with:

- ☐ A degree or professional equivalent or good 'A' levels.
- ☐ Two years' experience of systems analysis, including successful implementation of projects, and/or
- ☐ Three years' experience of programming, in COBOL, at a senior level.

It would be an advantage to be familiar with ICL 1900/2900 series.

Salaries will be negotiated within a scale from £5,171 - £8,023, according to qualifications and experience.

Programmers to £4,900

A number of programmers are required to be responsible to a Project Leader or Systems Analyst for the efficient and accurate production of computer programmes to specification for the Authority's ICL 1903T and for the replacement ICL 2960.

Applications are invited from candidates with:

- ☐ Good academic or professional qualifications
- ☐ Two years' experience in PLAN/COBOL or FORTRAN on an ICL 1900 series.

Experience of ICL 2960, systems analysis, databases etc. would be an advantage.

Salaries will be negotiated within a scale from £2,957 - £4,926, according to age, qualifications and experience.



For an application form please write or telephone:
A Bennett, Civil Aviation Authority,
Personnel Branch 2, Aviation House,
129 Kingsway, London WC2B 6NN.
Tel: 01-405 6922 Ext 898.
Applications must be returned not later than 6 September 1977.

TRIED ANY NEW POSITIONS LATELY?

OTHELLO — an addition from Computer Weekly — page 17.

IBM 370/135 HARDWARE ENGINEER

SDI BERMUDA require an experienced engineer with 370/135 training to become the company's Hardware Specialist. Applicants should have extensive field experience in the maintenance of IBM 360 and 370 peripherals, and preferably would have had some supervisory experience. Bermudian applicants are especially welcome. SDI, the creators of such software packages as GRASP, GRASPV5, FLEET, and EPAT invite the successful applicant to maintain and advise on the company's hardware requirements for its Research and Development Centre in Hamilton, Bermuda. Bermuda is a conservative British colony in the mid-Atlantic, less than two hours from New York. It has pleasant climate and stable government. Salaries are paid in US dollars and there is no income tax. SDI will assist in obtaining work permits for the successful applicant (who must have a maximum of two dependent children). A relocation allowance will be paid. If you require an application form, or more information about SDI or about Bermuda, please telephone Marion Lustig at SDI London (01) 731 4313. If you wish to apply for this position you must do so in writing to:

Personnel Manager, Reference BDA/HS,
SDI, 184 New Kings Road, London SW6 4NF.

SDI

RPG ANALYSTS AND PROGRAMMERS

£5000+

BIRMINGHAM

We are retained to find a small number of RPG2 analysts and programmers for the consultancy arm of a large international company. We are looking for the following background:

- ★ RPG2 experience on any hardware. COBOL would be useful.
- ★ Ability to work to realistic schedules and high standards.
- ★ Wish to move into systems work and project management.

Our client's offer the following:

- ★ Excellent salary and benefits of a large company.
- ★ You will be able to make a real contribution to a small team.
- ★ Progression will be rapid, based on performance.
- ★ New software and hardware developments.
- ★ Relocation expenses will be paid where necessary.

For a confidential discussion, contact Mike Heslan, quoting reference CW19.

021-632 6648 (24-hr.)
COMPUTER PERSONNEL CONSULTANTS
HOTUNA, NEW ST., BIRMINGHAM

CPC

RECRUITMENT CONSULTANTS LONDON - MANCHESTER - BIRMINGHAM INCOMES - £6-10K

SCR - Specialist Computer Recruitment Ltd. is in the forefront of the recruitment of Data Processing Professionals in the UK. It's established offices now have additional opportunities through a policy of continued expansion and growth of this and it's associated computer services companies.

Specifically:

for LONDON

Experienced D.P. recruitment persons interested in moving into a more professional, rewarding and stimulating working environment.

for BIRMINGHAM and MANCHESTER

persons should have:

- * Ideally an understanding of recruitment
- * developed sales attitudes and genuine sales experience
- * a knowledge of the data processing industry

and be:

- * "self-starters" with a preparedness to work under pressure

Each of these positions offer, by industry standards, the opportunity to earn exceptionally high earnings in a stimulating atmosphere. These earnings, it should be appreciated, are directly related to results.

If you think this could be you:

CONTACT: PETER RIGBY on 021-236 3781

REF: 77/08/17

SPECIALIST COMPUTER RECRUITMENT LTD.

BIRMINGHAM 021-236 3781 FREEPOST

Freeport, Equity and Law House, 35-37 Great Charles Street Queensway, Birmingham B3 2BR

MANCHESTER 061-833 0676 FREEPOST

Freeport, Corn Exchange Buildings, Corporation Street, Manchester M4 8BD

LONDON 01-933 0671 FREEPOST

Freeport 6, 102, Blandford Street, London W1E 1JZ



SCR

EXECUTIVE - CONSULTANT -MANAGER

MAJOR INTERNATIONAL RESPONSIBILITY

Managing 25 Professional Staff plus Budget for Expansion

Basic Salary - £7,000-£8,000 - Total Compensation potential from profit participation circa £12,000

One of Europe's largest and most successful Software Consultancy Houses requires a manager to extend their capabilities and International market share.

Based in the U.K. he will be managing 25+ professional staff operating in all advanced areas of the Computer Market, including consultancy and implementation. Areas of responsibility include Technical Management, Resource, Organisation, Marketing, Contract Control and most important of all, achievement of profit objectives. Candidates will have a degree or professional qualification, management capability, extensive computer experience and will probably have held a significant position in a professional Software and Consultancy House environment.

In addition to this experience we will be looking for the following characteristics: NUMERACY, CREATIVITY, STRATEGIC MARKETING ABILITY, LEADERSHIP, and a strong ENTREPRENEURIAL FLAIR.



Crown House, Morden, London SM4 5EU

recruitment division

01-540 8311

24 hour answering service



PRODUCT NOTES

Portable version of Informer VDU

FOLLOWING the introduction of the Informer range of VDUs into the UK last year, Cole Electronics is to make available a portable version.

Intended for mobile personnel in the data-capture market, it needs no special operating environment.

Available as a briefcase-sized unit with a recessed carrying handle, it features a hinged keyboard which folds down to reveal the screen and controls.

The chips are soluble in petrol, sulphuric acid, benzene, nitrile and paint thinners.

Character interactive transmission is facilitated by one model that is fitted with a full duplex/half duplex switch, but a polled block mode alternative may be selected.

Bit rates of 110, 150, 300, 600, 1,200, 2,400, 4,800 and 9,600 bits per second can be selected via a front panel switch on both units.

An acoustic coupler for direct connection to any telephone line can be incorporated - whether on locations at a remote site or in a hotel room.

This option is available for transmission at 110, 150, or 300 baud in half or full duplex modes; or at a rate of 1,200 baud in half duplex mode.

Cole added that other options available include direct connection to high speed modems via an RS232C interface to the computer system or hard-wired direct connection to the designated line.

The CCITT V24 interface is available if the VDU is required to drive a printer, offline storage facilities in the form of add-on cassette units or floppy disc drives; and a composite video output for driving large screen monitors.

The terminal weighs 23lb (10.5kg) and it measures 5 1/2 x 13 1/2 x 20 1/2 inches (13.5 x 34 x 52 centimetres). Its six-inch screen displays 512 characters - 16 lines of 32 characters each - which are visible at dual level intensities and it can be supplied for 50Hz operation.

Cole Electronics Ltd (CW), 33-35 Lower Coombe Street, Croydon, CR0 1AA. Tel: 01-888 8822.

UK launch for Styrofill loose-fill packing material

SPICER-COWAN is to manufacture under licence and distribute in the UK the Styrofill expanded polystyrene loose-fill packaging material developed by BASF in West Germany.

The saddle-shaped chips will be available in 15 cubic feet polythene sacks that can be adapted into hopper mode.

It added that Styrofill was chemically inert and resistant to most common materials and many corrosive chemicals; but would be attacked by some strong oxidising agents.

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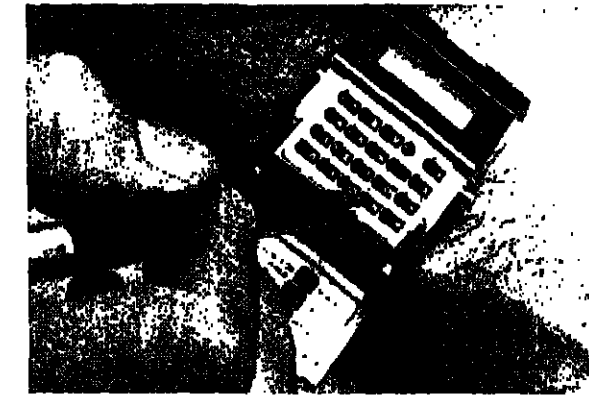
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Cole Electronics Ltd (CW), 33-35 Lower Coombe Street, Croydon, CR0 1AA. Tel: 01-888 8822.



Daisy wheel printer

A DAISY wheel printer claimed to be the only one on the market with two rows of characters on the stems is now available from Ultronic Data Systems. Called the UDS-Rich RP-40 it can run at up to 40 cphs.

The 96-character daisy wheel on the RP-40 is fitted with top-character stems which slip over the plastic stems. The wheel is 20% smaller than other types and UDS said that this improves print quality, increases print speed and gives the wheel an increased life because of the lower hammer impact required. Line length is 136 characters at 10 pitch.

Ultronic Data Systems, UDS House, 3 Jefferson Way, Thame, Oxon OX9 3SU. Tel: Thame (084 421) 3151.

Engineering system

A COMPUTER system, designed expressly for process control, has been introduced by the Stevenage, Herts firm of Taylor Instrument Company.

Named Polstar, the system features Taylor's own high level language POL-3 which uses familiar process control terms to define operating procedures and an industrial control, application package, ICAP.

The basic hardware complement for the Polstar system includes a 32K word minicomputer with a real time clock, hardware multiply-divide, 64 priority interrupt levels and automatic power failure/restart control keyboard printer terminal for system input or printouts, flexible disc memory and modular process interface. The mini can be upgraded to 64K words in size.

The system supports a full complement of peripherals that include dedicated line printers, paper tape and card handlers and monochrome or colour VDUs.

Taylor Instrument Company Ltd (CW), Gannels Wood Road, Stevenage, SG1 2EL. Tel: 0455 2868.

Multi-form printer

ANNOUNCING the introduction of a variable pressure 30 cph multi-form printer is GNT Automatic of Slough, Berks.

Named MFP, GNT said that it was based on the General Electric TerminiNet 20 matrix printer. Designed for operator convenience, the MFP allows a selector to be used to pick the numbers of copies needed from a single copy to up to nine copies with settings in between.

The MFP is equipped with a new design of tear bar to ensure efficient handling of multi-part forms and it accepts paper stock ranging in thickness from 0.0025 inches (0.0635 mm) to 0.0280 inches (0.7110 mm).

GNT Automatic (UK) Ltd (CW), Windsor House, 1 Albert Street, Slough, SL1 2BH. Tel: Slough 7241.

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The MFP is equipped with a new design of tear bar to ensure efficient handling of multi-part forms and it accepts paper stock ranging in thickness from 0.0025 inches (0.0635 mm) to 0.0280 inches (0.7110 mm).

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Monitor

A TEMPERATURE and humidity monitoring instrument giving a permanent 24 hour day record has been introduced by Wright Air Conditioning of Birmingham.

Housed in a glass fronted wall cabinet, the monitor has adjustable high and low limit relays to give audible and visual alarms. The seven-day chart in the monitor can be changed in two or three minutes.

Wright Air Conditioning, Sampson Road North, Camp Hill, Birmingham, B11 1BL. Tel: 021-775 7241.

Modem

A LOW cost modem announced by Borer Electronics is designed to operate at any asynchronous speed up to 1,920 bps. Known as the Model 12/18, it is available in three versions that all incorporate comprehensive diagnostic facilities, and are Bell and CCITT compatible. Prices start from £150, with delivery in four weeks.

Borer Electronics Ltd (CW), Fishponds Road, Wokingham, Berkshire RG11 2QA. Tel: 0734 78372.

Puzzle answer

LET us imagine that the distance travelled by the wire (10 x 4 = 40cm) is the base of a triangle with cylinder length the height. Then the hypotenuse of such a right-angled triangle will obviously equal the actual length of the wire.

Pythagoras: $a^2 + b^2 = c^2$ gives $10^2 + 4^2 = c^2$ so $160cm$ is in fact 1cm.

WE URGENTLY NEED ANALYSTS, PROGRAMMERS AND OPERATORS FOR CLIENTS THROUGHOUT THE UK

Demand for experienced personnel maintains a very high level. We would like to hear from you if you are currently considering a new job. Briefly detailed below are a selection of clients' requirements.

PROGRAMMERS

London

SW1	IBM OS COBOL 3 yrs. + to £5,000 p.a.
City	6 MOS + ICL COBOL to £3,000 p.a.
City	IBM DOS or OS COBOL to £5,000 p.a.
W1	2 yrs + OS COBOL to £5,500 p.a.
W1	3 yrs. + DOS/VS Ass. to £5,300 p.a.
City	2 yrs. Ass. or PL1 to £4,500.
West London	3 yrs + 1900 COBOL to £5,000 p.a.
West End	1 yr. pref. IBM COBOL £3,000 +.

Home Counties

Sussex	2 yrs. + OS COBOL to £4,500.
Sussex	3 yrs. + OS COBOL to £5,000.

Bucks.	3 yrs. + IBM COBOL to £5,500.
Herts.	18 mos. + any COBOL to £5,600.
Herts.	2 yrs. + 1900 COBOL to £4,800.
Essex	2 yrs. any Ass. or PL1 to £5,000.
Middx.	18 mos. 1900 COBOL to £4,000.

Other Areas

Warks.	2 yrs. FORTRAN to £4,000
Warks.	2 yrs. + Hon COBOL to £4,500.
Worcs.	2 yrs. 1900 COBOL to £4,000.
Durham	2 yrs. any COBOL to £4,500.
Midlands	IBM COBOL to £5,000.
Manchester	1 yr. + PL1 or PLAN to £4,500.
Liverpool	1 yr. + PL1 or PLAN to £4,500.

South Manchester	IBM Ass. COBOL and CICS to £5,000.
Lancs.	RPG II any experience to £4,600.

ANALYSTS

We currently have urgent requirements for analysts with three years + commercial systems design at many locations throughout the UK. Salaries are in a range up to £5,600 plus various benefits.

OPERATORS

We are particularly interested in hearing from IBM ICL operators with 12 to 18 months' experience for a variety of installations in London. Home Counties and the North of England.

CONTRACTS

We also have a number of requirements for Contracts Programmers. If you are currently available or will be within the next month or two, we would like to hear from you.

Silencer

WHAT is claimed to be the most effective silencing system yet offered for the Centronics line printer, is now available from Commercial Acoustics.

Called the Peacemaker, this silencing cover reduces ambient noise levels by 80%.

The use of transparent plastic on the cover has been kept to a minimum to avoid static build up and construction is of metal with acoustic foam lining.

The base is hinged to allow program loop changes and the access lid enables paper to be removed easily.

The cover can be installed in minutes and is available ex-stock direct from CAL or its agents.

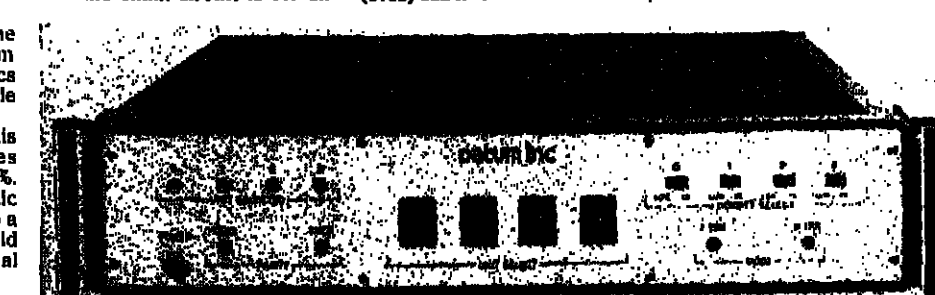
Commercial Acoustics Ltd (CW), Chables Road, Balham Hill, London SW12 8LD. Tel: 01-873 3333.

Matrix printer

A SILENT non-impact matrix printer, the MiniDip, which can print 80 columns at up to 30 cps has been introduced by Computer Engineering Ltd. of Hiltin, Herts.

The MiniDip comes with a 5 x 7 dot matrix print head and a standard CCITT V24 interface for transmission at 110/300 baud. It weighs 20lb and can be supplied in two versions, one with a standard ASCII key-board and the other as a printer only.

Computer Engineering Ltd., Cadwell Lane, Hiltin, Herts. Tel: Hiltin (0462) 8271.



Announcing the release of its "quad" 8191 series magnetic tape controllers onto the European market is Datum (Electronics).

The Harlington, Middlesex firm said that the controller overcame the problems of connections between two wire modem systems and a mainframe.

Designated the ATS 7828CA, the Haywards Heath, Sussex firm said that the device is priced at £280 per channel in stand-alone form.

The unit will allow 1,200 x 75 baud operation on a symmetrical 1,200 x 1,200 baud port or 600 x 75 baud on a 600 x 800 port.

ATS claimed that the 7828CA was designed as a cost-effective alternative to a small front-end communications computer and also that it enabled the use of full duplex over public switched telephone lines and two wire private lines.

ATS Communications Ltd (CW), 50 Bridge Road, Haywards Heath, Sussex. Tel: 0444 53377.

Communications adapter

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Converter

ANNOUNCING a paper tape/floppy disc converter, the Model 12/18, it is available in three versions that all incorporate comprehensive diagnostic facilities, and are Bell and CCITT compatible. Prices start from £150, with delivery in four weeks.

Borer Electronics Ltd (CW), Fishponds Road, Wokingham, Berkshire RG11 2QA. Tel: 0734 78372.

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Power unit

AN extensive range of low-cost power supply units offering a choice of voltage and current ratings is now available from Electronic Brokers.

The London, W1 firm said that the general purpose units are available providing continuously variable, stabilised and regulated supplies.

Examples include six to 14 volts at 25 amps (Model PG 76, priced at £25.00), 10 to 16 volts at 12 amps (Model PG 372 at £35.00) and four to 40 volts at two amps (Model HS 76/40, priced at £48.00).